State of California – A Natural Resources Agency
Gavin Newsom, Governor

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Caroline Thomas Jacobs, Director

November 8, 2024

Dear Stakeholders,

Enclosed is the Office of Energy Infrastructure Safety's (Energy Safety's) Annual Report on Compliance regarding Liberty Utilities execution of its 2022 Wildfire Mitigation Plan.

This Annual Report on Compliance is hereby published as of the date of this letter. Liberty Utilities may, if it wishes to do so, file a public response to this Annual Report on Compliance within 14 calendar days of the date of publication. Comments must be submitted to the Office of Energy Infrastructure Safety's E-Filing system in the 2022 Annual Report on Compliance docket.

Sincerely,

Patrick Doherty

Patrick Doherty
Program Manager | Compliance Assurance Division
Electrical Infrastructure Directorate
Office of Energy Infrastructure Safety

OFFICE OF ENERGY INFRASTRUCTURE SAFETY

2022 ANNUAL REPORT ON COMPLIANCE

LIBERTY UTILITIES

November 2024

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Executive Summary

The Office of Energy Infrastructure Safety (Energy Safety) is tasked with evaluating and either approving or denying Wildfire Mitigation Plans (WMP) annually filed by electrical corporations pursuant to Public Utilities Code section 8386 *et seq*. The law also directs Energy Safety to ensure that the electrical corporations have complied with their plans.

Energy Safety's evaluation concluded that Liberty Utilities (Liberty) completed 61 out of 68 (90%) of its WMP initiatives and all six of its key objectives for 2022.

Energy Safety found several deficiencies in Liberty's asset management and vegetation management inspection initiatives. Additionally, data provided by Liberty indicated wire down and outage events occurred at an escalated rate in 2022 when compared to 2021. However, when normalized by high wind warning days, the events showed little to no change or increase in risk since 2015.

Energy Safety found that Liberty's missed targets did not significantly hinder Liberty's ability to mitigate its wildfire risk. Often, the margins of the misses were minor and attributable to the weather. Furthermore, Liberty has made significant advancements and investments in its risk assessment and mapping, situational awareness, grid hardening, and emergency preparedness initiatives.

Pursuant to Government Code section 15475.1, Energy Safety's primary objective is to ensure that electrical corporations reduce wildfire risk and comply with energy infrastructure safety measures. Energy Safety's annual compliance evaluation of Liberty's execution of its 2022 WMP is a comprehensive look at whether Liberty's execution of its 2022 WMP reduced the risk of Liberty equipment igniting a catastrophic wildfire.

Energy Safety conducted its compliance review process through a variety of means including audits, field inspections, and analysis of data submitted by Utility to Energy Safety. Energy Safety also evaluated several performance metrics, including metrics that reveal the risk on Liberty's system. Energy Safety additionally reviewed the Liberty's self-assessment in its Electrical Corporation Annual Report on Compliance and the findings of its independent evaluator.

On balance, Liberty was largely successful in executing its plan for wildfire risk mitigation. While Energy Safety acknowledges that Liberty achieved its overarching objectives, there are still areas for improvement and continued learning, primarily as it relates to asset and vegetation inspections, and properly documenting initiative progress for the year.

1. Introduction

This Annual Report on Compliance presents the Office of Energy Infrastructure Safety's (Energy Safety's) statutorily mandated assessment of Liberty Utility's (Liberty's) compliance with its 2022 Wildfire Mitigation Plan (WMP). (Pub. Util. Code § 8386.)

In the sections that follow, Energy Safety describes the statutory regulatory basis for its reporting, the information supplied by the electrical corporation, and the independent analysis conducted by Energy Safety to examine Liberty's execution of its 2022 WMP and how its infrastructure performed in 2022 relative to wildfire risk. Finally, Energy Safety provides its conclusions, observations, and recommendations for further actions by Liberty.

1.1 Compliance Process

The statutory objective of electrical corporation wildfire mitigation planning efforts is to ensure that electrical corporations are constructing, maintaining, and operating their infrastructure in a manner that will minimize the risk of catastrophic wildfire. (Pub. Util. Code § 8386.) The objective of a WMP, and consequently the focus of Energy Safety's assessment of compliance, is wildfire risk reduction. An electrical corporation's obligations extend beyond meeting WMP targets.

Energy Safety's 2022 Compliance Process establishes the parameters for this Annual Report on Compliance. Consistent with the 2022 Compliance Process, this report considers the totality of all compliance assessments completed with respect to Liberty's 2022 WMP. This includes all inspection, audit, investigation, and data analysis work performed by Energy Safety, as well as separate electrical corporation and independent third-party evaluations of compliance. (Compliance Process, p. 6.)

Energy Safety evaluated whether the electrical corporation implemented the initiatives in its 2022 WMP, looking specifically at whether the electrical corporation funded and performed the work stated for each initiative. (Compliance Process, p. 7.)

Energy Safety considered the electrical corporation's stated goals and objectives of its plan, its performance of initiatives essential to reducing wildfire risk and achieving its objectives, and the ultimate performance of its infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk. (Compliance Process, p. 7.)

2. Liberty's 2022 Wildfire Mitigation Plan Update

Liberty submitted a comprehensive WMP in 2020, which covered a three-year term from 2020 through the end of 2022. Liberty submitted annual updates to the original 2020 WMP, including a 2022 Update to its 2020 WMP that is the subject of this Annual Report on

Compliance. Energy Safety approved Liberty's 2022 Update to its 2020 WMP (2022 WMP Update) on November 2, 2022.

Liberty's 2022 WMP Update stated that it represented "an actionable plan that is being fully implemented and integrated into Liberty's daily operations and will be an effective source to track risk reduction and improve efficiency through innovative system technologies." (2022 WMP Update, p. 25.)

Among other things, Liberty's 2022 WMP Update focused on several areas, which included continued grid hardening initiatives, increased use of situational awareness tools, enhancement of data collection and analytics to inform reporting, risk modeling and decision-making, improvement of asset management and inspections processes, and increased preparedness for Public Safety Power Shutoff (PSPS) events (2022 WMP Update p. 25.) Liberty's near-term goals for 2022 included:

- Continued improvement of Liberty's wildfire risk modeling capabilities.
- Determining gaps in camera network coverage, evaluating the need for additional camera installations, identifying potential site locations for weather stations, and developing more advanced use cases for fault indicators.
- Completing 9.55 miles of covered conductor, 231 pole replacements, 1,500 fuse replacements, 45 tree attachment removals, and five Oil Circuit Breaker (OCB) replacements at Tahoe City and Squaw Valley substations.
- Completing asset inspections scheduled for 2022 and finalizing the requests for proposal (RFPs) for infrared asset inspections and quality assurance pilot programs to begin a bidding process.
- Completing 1,322 miles of vegetation inspections, and 1,116 miles of vegetation maintenance.
- Installing four additional line reclosers and continuing to explore fault detection with communications capabilities to determine fault locations more quickly.
- Standardizing monthly, quarterly, and annual WMP reports.
- Utilizing Liberty's updated fire risk map and circuit risk analysis to inform discussions regarding WMP initiative prioritization. Additionally, refine risk spend efficiency (RSE) data inputs and calculations initiating planning and design on major capital projects for 2024.
- Engaging with local stakeholders to prepare for and respond to fire-related events, continuing to implement Liberty's 2022 Access and Functional Needs (AFN) plan, and maintenance/enhancement of emergency response plans.
- Surveying customers, Community Based Organizations (CBO), community partners, and stakeholders to understand wildfire and PSPS awareness. Additionally, understanding customer needs, strengthening and expanding partnerships with CBOs

that support AFN communities, and identifying better channels to communicate with the broader community. (2022 WMP Update, p. 95-97.)

In Supplemental Table 5.3-1, Liberty generally describes that the "Target %/Top-Risk %" designations for its initiative targets were based on the Polygon Risk Ratings from Liberty's Wildfire Risk Map. Liberty noted that approximately 92% of its service territory lies within High Fire Threat District (HFTD) Tier 2 and Tier 3 regions, and through the Polygon Risk Ratings the Tier 2 areas are further disaggregated into four distinct risk profiles: Low, Moderate, High, and Very High. (2022 WMP Update, p. 34.)

Section 5.1 provides a table that describes the 68 activities of the varied initiatives contained in Liberty's 2022 WMP Update and evaluated by Energy Safety in this ARC. Please refer to Section 5.1 for more detail on those 68 initiative activities.

3. Liberty's Annual Report on Compliance

Public Utilities Code section 8386 directs electrical corporations to file a report addressing the electrical corporation's compliance with their WMP during a compliance year. This document is known as the Electrical Corporation Annual Report on Compliance (EC ARC).

Energy Safety's 2022 Compliance Process outlines the requirements for an EC ARC. The EC ARC must detail the electrical corporation's self-assessment of its compliance with the 2022 WMP during the 2022 compliance period. Energy Safety's 2021 Compliance Operational Protocols also apply to EC ARCs for the 2022 compliance period. These Protocols outline the requirements for EC ARCs, including an assessment by the electrical corporation of whether it met its intended risk reduction by implementing all of its approved WMP initiatives (i.e., the degree to which initiative activities have reduced ignition probabilities), descriptions of all planned WMP initiative spending versus actual WMP initiative spending, and an explanation of any differentials between the planned and actual spending. (Ops Protocols, pp. 10-12.)

Liberty submitted its EC ARC to Energy Safety on March 31, 2023. The following is a narrative summary of the EC ARC.

Liberty asserted that its overall progress in 2022 achieved the intended risk reduction of its WMP initiatives. Liberty stressed that through its WMP initiatives, it minimized societal consequences of wildfires and PSPS events, with special consideration to the impact on AFN populations and marginalized communities. (EC ARC, p. 2.)

3.1 EC ARC Information on Initiative Completion

In its EC ARC, Liberty described its progress across ten WMP initiative categories. In its description of progress, Liberty did not identify the number of WMP initiatives targeted and did not distinctly report on progress for each initiative. Liberty discussed its 2022 work and its

progress on critical projects. Among the quantitative activities for which Liberty exceeded its targets, instances were:

- Initiative 7.3.3.12 – Removed 145 tree attachments, as compared to a target of 45.
- Initiative 7.3.4.1 – Completed 328.6 miles of detailed asset inspections, as compared to a target of 307.8 miles.
- Initiative 7.3.4.6 – Completed 2,735 intrusive pole inspections, as compared to a target of 2,598 intrusive pole inspections.
- Initiative 7.3.5.5 – Completed 515 acres of fuel management and reduction of slash from vegetation management activities, as compared to a target of 280 acres.
- Initiative 7.3.5.11 – Completed 235 miles of patrol inspections of vegetation around distribution electric lines and equipment, as compared to a target of 171[1] miles.
- Initiative 7.3.5.14 – Completed 271.7 miles of QA/QC for its vegetation management inspections, as compared to a target of 221 miles.
- Initiative 7.3.5.16 – Completed 203 miles of removal and remediation of trees with strike potential to electric lines and equipment, as compared to a target of 171[2] miles.

Liberty noted several instances of non-attainment of quantitative WMP initiatives in its 2022 EC ARC, including:

- Initiative 7.3.4.9 – Replaced 226 out of 231 targeted poles identified as General Order 165 Level 2 replacements.
- Initiative 7.3.3.9 – Installed two out of four targeted automatic reclosers, citing delays due to access issues caused by snow and avalanche danger.
- Initiative 7.3.3.16 – Completed 0.24 of its targeted 0.36 miles of undergrounding projects due to permitting issues.
- Initiative 7.3.4.1 – Completed 201.6 out of 222 targeted miles of detailed inspections of vegetation around distribution electric lines and equipment, citing a high amount of tree mortality that required a shift in inspection resources.
- Initiative 7.3.4.11 – Completed 503 of its targeted 706 miles of patrol asset inspections due to establishing an erroneous target.

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[1] Liberty's 2022 WMP Update references a target of 167 miles of patrol inspections for vegetation, but its Q4 2022 QDR lists a target of 171 miles. Either way, Liberty exceeded both.

[2] Liberty's 2022 WMP Update references a target of 127 miles of removal and remediate of trees with strike potential, but the Q4 2022 QDR lists a target of 171 miles. Either way, Liberty exceeded both listed targets.

- Initiative 7.3.4.14 – Conducted QA/QC on 0.44% of detailed asset inspections instead of a targeted 0.5%.
- Initiative 7.3.5.15 – Completed 223 out of 238 targeted miles of remediations of at-risk species, citing a high amount of tree mortality that required a shift in tree work resources.

From the examination of the data provided in the EC ARC, it is also apparent that there was an additional missed quantitative WMP initiative activity regarding initiative 7.3.2.1, where Liberty installed five out of 10 targeted weather stations.

For both qualitative and quantitative initiative activities in which Liberty provided insufficient or limited reporting on progress, results are provided in this document in Appendix A, Table 6.

3.2 EC ARC Information on Initiative Funding

Information supplied by Liberty on its initiative funding is in Appendix C. In general, Liberty underspent on its 2022 WMP Update initiatives by $4,994,024 (approximately nine percent of total planned expenditure).

Liberty did not assert that this underspend impacted its ability to meet its 2022 WMP Update initiative targets. Liberty attributed underspending to several factors, including delays in project implementation (for example, because of permitting delays), lower than expected capital costs, and lower than expected labor costs. (EC ARC, p. 12-19.)

4. Independent Evaluator ARC for Liberty

Energy Safety, in consultation with the Office of the State Fire Marshal, annually publishes a list of entities qualified to serve as independent evaluators of WMP compliance. (Pub. Util. Code § 8386.) Each electrical corporation is required to contract with an Independent Evaluator (IE) from the list to perform a compliance assessment. (Pub. Util. Code § 8386.)

The IE reviews and assesses the electrical corporation's compliance with its approved WMP. As part of its evaluation, the IE must determine whether the electrical corporation failed to fund any activities included in its plan.

On July 1st of each year, the IE issues its IE's Annual Report on Compliance (IE ARC) for a given electrical corporation. (Pub. Util. Code § 8386.)

The 2022 IE ARC for Liberty was prepared by Bureau Veritas North America, Inc. The IE ARC reviewed the wildfire mitigation initiatives and Liberty implemented in 2022 and evaluated whether Liberty met its performance objective targets, underfunded any of those targets, and followed its QA/QC processes. The IE determined that, overall, Liberty's initiative activity work met the requirements of its WMP. The IE also determined that Liberty did not reach its

planned expenditure in eight out of ten WMP initiative categories but did not comment on whether this underfunding significantly impacted completion of Liberty's initiatives and targets. Finally, the IE concluded that Liberty applied its QA/QC programs to ensure work related to WMP initiatives reduced ignition probabilities. (IE ARC, pp. 5-6, 62-64.)

The IE conducted a field inspection of Liberty's field verifiable WMP initiatives to analyze Liberty's progress toward meeting its WMP commitments. To test Liberty's assertion that it met its 2022 WMP initiative 7.3.3.7 (Expulsion fuse replacement) target of replacing 1,500 non-exempt expulsion fuses identified on poles in Tier 2 and Tier 3 HFTD areas, the IE sampled 192 of the reported 1,858 expulsion fuse replacements. The IE stated that 188 sampled locations complied with the initiative, and four (or 2%) were found to be out of compliance since the fuses had not been upgraded to an exempt fuse type. Based on this review, and in spite of the discovery of a 2% error rate, the IE concluded that Liberty likely met and exceeded its stated commitment to replace 1,500 fuses. (IE ARC, pp. 25-26.)

For initiative 7.3.5.15 (Identification and Remediation of "at-risk" species), the IE found two out of 31 sample sites where Liberty reported removal of at-risk species of trees, but said trees were not removed. The IE therefore determined that Liberty did not meet its goal with respect to initiative 7.3.5.15. (IE ARC, pp. 32, 149.)

As shown in the list below, the IE found that of the 43 WMP initiative activities reviewed, six were not met, as described below. (IE ARC pp. 146- 150.)

- Initiative 7.3.2.1 – Advanced weather monitoring and weather stations.
- Initiative 7.3.3.6 – Distribution pole replacement and reinforcement, including with composite poles.
- Initiative 7.3.3.16 – Undergrounding of electric lines and/or equipment.
- Initiative 7.3.4.11 – Patrol inspections of distribution electric lines and equipment.
- Initiative 7.3.5.2 – Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment.
- Initiative 7.3.5.15 – Identification of "at-risk" species.

The IE noted 21 instances of underfunding, primarily in Grid Design and System Hardening, Asset Management and Inspections, and Emergency Planned and Operations. This underfunding was mostly related to project delays and reprioritization of vegetation conditions. Additionally, it appears Liberty underfunded several asset management and inspection initiatives because Liberty did not track or report actual expenditure against planned expenditure. Liberty generally self-reported these findings. (EC ARC, pp. 65 -71.)

5. Energy Safety Evaluation of WMP Initiative Completion

Energy Safety's evaluation of Liberty's performance in 2022 indicates that Liberty completed 61 of its 68 initiative activities,[3] did not meet targets for five initiative activities, and did not provide sufficient information for a conclusion to be drawn regarding two initiative activities. Therefore, Energy Safety finds that Liberty completed 90% of its initiative activities.

The subsections below describe Energy Safety's evaluation of Liberty's execution of its WMP in 2022.

5.1 Liberty's 2022 WMP Update Initiative Activity Assessed by Energy Safety

Energy Safety evaluated the totality of the compliance data available, including Liberty's 2022 WMP Update, the EC ARC, the IE ARC, Liberty's Quarterly Data Reports (QDRs), and responses to data requests received from Liberty. The table below, Table 1, itemizes each of the 68 initiative activities that Energy Safety assesses in this ARC.

Table 1: Liberty's Planned Activities in its 2022 WMP Update

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment (7.3.1.1)	Use of wildfire risk polygons as the basis for updating circuit risk assessment and for wildfire mitigation planning. Analysis of asset risk, tree risk, outage risk, and risk reduction from WMP initiative implementation.
Climate-driven risk map and modelling based on various relevant weather scenarios (7.3.1.2)	Continue using tools such as REAX maps and data to estimate the incremental risk of foreseeable climate scenarios, such as drought, across a given portion of the grid (or, more granularly, e.g., circuit, span, or asset).

[3] Although the IE evaluated 43 initiatives, Energy Safety evaluated 68 initiative activities listed in Liberty's 2022 WMP Update. While the IE determined that 6 initiative activities were not met or insufficiently reported, Energy Safety determined that 7 initiative activities were either not met or insufficiently reported due to a review of information received from Liberty subsequent to the IE ARC.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Ignition probability mapping showing the probability of ignition along the electric lines and equipment (7.3.1.3)	Use available data and tools to analyze asset risk and processes to assess the risk of ignition across regions of the grid (or, more granularly, e.g., circuits, spans, or assets).
Initiative mapping and estimation of wildfire and PSPS risk-reduction impact (7.3.1.4)	Develop a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and the risk-spend efficiency of various initiatives.
Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment (7.3.1.5)	Develop and use of tools and processes to assess impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary damages, area burned, impact on air quality and greenhouse gas (GHG) reduction goals, etc.)
Advanced weather monitoring and weather stations (7.3.2.1)	Install 10 weather stations.
Continuous monitoring sensors (7.3.2.2)	Install DFA hardware on 10[4] distribution feeders by the end of 2022. High Impedance Faults Detection (HIFD) is set to be deployed in 2022. The HIFD settings produced by University of Nevada Reno will be installed into the protection relays feeding piloted lines. ALERT Wildfire Cameras: Finalize partnership for eight fire cameras in the second quarter of 2022, which will provide access to the camera network prior to 2022 fire season.
Fault indicators for detecting faults on electric lines and equipment (7.3.2.3)	Install two circuits with fault indicators.

[4] In Section 7.3.2.2 of its 2022 WMP Liberty states a target of 105 DFA installations, but based on review of 2022 Q1 QDR Table 12, which states a target of 10 units, this is presumed to be a clerical error.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Forecast of a fire risk index, fire potential index, or similar (7.3.2.4)	Continue use of FPI for fire risk awareness, improving operational decision-making, and ensuring ongoing improvements in forecast accuracy for effective wildfire mitigation.
Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions (7.3.2.5)	Position personnel within utility service territory to monitor system conditions and weather on site. Field observations shall inform operational decisions.
Weather forecasting and estimating impacts on electric lines and equipment (7.3.2.6)	Develop methodology for: forecasting weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision making, learning to reduce false positives and false negatives of forecast PSPS conditions.
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault (7.3.3.2)	Complete one substation circuit breaker replacement.
Covered conductor installation (7.3.3.3)	Complete 9.55 miles of covered conductor installation.
Distribution pole replacement and reinforcement, including with composite poles (7.3.3.6)	Complete 231 pole replacements.
Expulsion fuse replacement (7.3.3.7)	Complete 1,500 expulsion fuse replacements.
Grid topology improvements to mitigate or reduce PSPS events (7.3.3.8)	Prepare to launch Phase 1 of the Customer Resiliency Program in 2023 pending approval by CPUC.
Installation of system automation equipment (7.3.3.9)	Install four-line reclosers.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Other corrective action (7.3.3.12)	Tree attachments: Remove 45[5] tree attachments. Animal guards: Complete animal guard installations on the six[6] largest substations. CAL FIRE exempt hardware: Continue actively using CAL FIRE exempt hardware on all new and replacement installations. Open wire/grey wire: Continue actively identifying areas with open wire/grey wire secondary and then verifying that pole calculations are adequate and then conduct replacement.
Undergrounding of electric lines and/or equipment (7.3.3.16)	Complete 0.36[7] miles of undergrounding in addition to Rule 20 undergrounding projects.
Detailed inspections of distribution electric lines and equipment (7.3.4.1)	Complete 308 miles of inspections.
Improvement of inspections (7.3.4.3)	Implementation of a QA/QC program for asset inspections and planning to pilot the use of infrared technology in 2023
Intrusive pole inspections (7.3.4.6)	Complete 2,598[8] pole inspections.
Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations (7.3.4.9)	Complete operations and maintenance repairs for all Level 2 findings.

[5] While Table 12 of the QDR states a target of 60 units, Table 5.3-1 of the WMP and Section 7.3.3.12 of the WMP state a target of 45 tree attachment removals.
[6] While Table 5.3-1 of the WMP states a target of four animal guard installations, Section 7.3.3.12 of the WMP states a target of installing animal guards on six substations.
[7] While Section 7.3.3.16 of the WMP states a target of 0.37 miles, Table 5.3-1 of the WMP, as well as Table 12 of the QDR, state a target of 0.36 miles.
[8] While Section 7.3.4.6 of the WMP states a target of 2,600 pole inspections, Table 5.3-1 of the WMP, as well as Table 12 of the QDR, state a target of 2,598 pole inspections.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Patrol inspections of distribution electric lines and equipment (7.3.4.11)	Complete 706[9] miles of inspections.
Quality assurance / quality control of inspections (7.3.4.14)	Complete QA/QC inspections on 0.5% of circuit miles. A qualified third-party contractor will be selected in order to validate that inspections are conducted in an effective manner in compliance with General Order (G.O.) 165 inspection process and G.O. 95 construction standards.
Substation inspections (7.3.4.15)	Complete 42 substation inspections.
Additional efforts to manage community and environmental impacts (7.3.5.1)	Complete nine miles of treatment.
Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment (7.3.5.2)	Complete 221 miles of inspections.
Detailed inspections and management practices for vegetation clearances around transmission electrical lines and equipment (7.3.5.3)	Conduct visual inspections and maintenance of vegetation around the transmission right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded. Describe the frequency of inspection and maintenance programs.

[9] The 2022 Q1 QDR Table 12 target of 70 units is presumed to be a clerical error based on the target in Table 5.3-1 from the 2022 WMP Update of 706 miles.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Emergency response vegetation management due to red flag warning or other urgent climate conditions (7.3.5.4)	Plan and execute vegetation management activities, such as trimming or removal, executed based upon and in advance of forecast weather conditions that indicate high fire threat in terms of ignition probability and wildfire consequence.
Fuel management (including all wood management) and management of "slash" from vegetation management activities (7.3.5.5)	Complete 280 acres of fuel management.
Improvement of inspections (7.3.5.6)	Identify and address deficiencies in inspection protocols and implementation by improving training and the evaluation of inspectors.
Remote sensing inspections of vegetation around distribution electric lines and equipment (7.3.5.7)	Complete 701 miles of inspections. Pilot the use of imagery that has been collected along with the LiDAR to perform tree health analysis. Analysis will be completed within Q2 of 2022, and testing the data for incorporating into inspection processes will begin in Q3 and Q4 of 2022.
Remote sensing inspections of vegetation around transmission electric lines and equipment (7.3.5.8)	Describe the methods for inspecting transmission rights-of-way using LiDAR.
Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations (7.3.5.9)	Inspect the distribution rights-of-ways and the adjacent vegetation that may be hazardous, which goes beyond the minimum standards in rules and regulations
Other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations (7.3.5.10)	Inspect transmission rights-of-way to identify vegetation hazards.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Patrol inspections of vegetation around distribution electric lines and equipment (7.3.5.11)	Complete 167 miles of inspections.
Patrol inspections of vegetation around transmission electric lines and equipment (7.3.5.12)	Inspect transmission rights-of-way to identify vegetation hazards.
Quality assurance / quality control of vegetation management (7.3.5.13)	Complete QA/QC on 220 miles of inspections.
Recruiting and training of vegetation management personnel (7.3.5.14)	Ensure that the utility can identify and hire qualified vegetation management personnel and to ensure that both employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety. Include discussion of continuous improvement of training programs and personnel qualifications.
Identification and remediation of "at-risk species" (7.3.5.15)	Complete 238 miles of identifications and remediations.
Removal and remediation of trees with strike potential to electric lines and equipment (7.3.5.16)	Complete 127 miles of removals and remediations.
Substation inspections (7.3.5.17)	Inspect vegetation surrounding substations.
Substation vegetation management (7.3.5.18)	Reduce the ignition probability and wildfire consequences attributable to contact from vegetation to substation equipment
Vegetation management system (7.3.5.19)	Implement the Vegetation Management System throughout its footprint.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Vegetation management to achieve clearances around electric lines and equipment (7.3.5.20)	Complete 701 miles of inspections and clearings.
Vegetation management activities post-fire (7.3.5.21)	Conduct fire mitigation work in accordance with Liberty's special use permit on Federal lands, and in accordance with Section 7.3.5.15 (Identification and remediation of 'at risk' species) and Liberty's Hazard Tree Management Plan (VM-03) on other lands."
Protective equipment and device settings (7.3.6.2)	Use protective equipment and device settings during high fire threat days in areas identified as significant risk for ignition.
Crew-accompanying ignition prevention and suppression resources and services (7.3.6.3)	Continue to equip all field crews with required prevention and suppression tools.
Personnel work procedures and training in conditions of elevated fire risk (7.3.6.4)	Require all employees, contractors, and consultants that conduct activities in the wildland areas of the service territory receive training on an annual basis.
Protocols for PSPS re-energization (7.3.6.5)	Design and execute procedures that accelerate the restoration of electric service in areas that were de-energized, while maintaining safety and reliability standards.
PSPS events and mitigation of PSPS impacts (7.3.6.6)	Continue established plans and protocols to support all customers during potential PSPS events, including vulnerable and Medical Baseline (MBL) customers.
Stationed and on-call ignition prevention and suppression resources and services (7.3.6.7)	Purchase additional vehicles that can be used by designated field staff and crew members during elevated fire risk conditions.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Centralized repository for data (7.3.7.1)	Continue improvements and upgrades made to centralizing data systems. Continue conversations with consultants offering data analytics solutions for considering major system upgrades and integration with all current data sources.
Collaborative research on utility ignition and/or wildfire (7.3.7.2)	Deploy HIFD in 2022. HIFD settings produced by University of Nevada Reno will be installed into the protection relays feeding piloted lines.
Tracking and analysis of risk event data (7.3.7.4)	Track all ignitions and risk events related to Liberty equipment across its service territory. Develop integrated data management and reporting solutions to improve data consistency and efficiencies.
Allocation methodology development and application (7.3.8.1)	Continue to refine risk modeling and risk spend efficiency calculations, based on maturation of the risk analysis process and lessons learned from other utilities.
Risk-spend-efficiency analysis – not to include PSPS (7.3.8.3)	Continue to improve and refine its Risk-spend-efficiency (RSE) calculations and actively participate in Joint investor-owned utility (IOU) workshops and discussions on the RSE metric.
Adequate and trained workforce for service restoration (7.3.9.1)	Ensure an adequate and trained workforce for service restoration. Add additional crew members to improve emergency restoration and normal day-to-day work.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Community outreach, public awareness, and communications efforts (7.3.9.2)	Continue community outreach, public awareness, and communication efforts, including Use of digital communications in 2022 and beyond. Adding two positions to expand CBO relationship networks and communications channels and plans to make further progress throughout 2022, including a bilingual Outreach Coordinator. Continue practice of facilitating daily workshops for both Public Safety Partners and customers during potential PSPS events in 2022. Use gathered feedback to evaluate, refine and improve customer and public education efforts for 2022 and follow a similar process in the coming years. Invest in improvements that enhance both wildfire safety and PSPS communications in 2022. The public education campaign will start earlier in the year and will work to expand the reach of communications within the service territory. Implement an adjusted strategy for 2022 AFN identification and continue to focus on available resource communication in 2022.
Customer support in emergencies (7.3.9.3)	Continue customer support in emergencies.
Disaster and emergency preparedness plan (7.3.9.4)	Continually look for opportunities to improve the disaster and emergency preparedness plan and to collaborate with local agencies, communities, and other stakeholders to maintain protocols and satisfy requirements.
Preparedness and planning for service restoration (7.3.9.5)	Exercise the PSPS plan annually and incorporate lessons learned.
Protocols in place to learn from wildfire events (7.3.9.6)	Review the availability of software systems to confidentially store and retrieve lessons learned from exercises and events.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Community engagement (7.3.10.1)	Continue awareness, with a focus on improved customer, community, and utility readiness in the face of growing wildfire threat. Outreach and engagement objectives for 2022 include: Adapting to shifting needs and priorities in emergency preparedness and wildfire mitigation. Hosting regionalized discussions with public safety partners to enhance knowledge of regional driving factors for PSPS events and other potential emergency events. Strengthening partnerships between public safety partners and Liberty representatives, establishing point-of contacts that can address needs both during an emergency event and throughout the year. Customizing outreach approach and cadence based upon the community's wildfire risk, with a key focus on providing more heavily impacted communities with information and resources. Approaching public safety partners and customers with transparency while providing timely and accurate information that supports emergency preparedness and localized wildfire mitigation efforts. Liberty notes that other unforeseen factors may have an impact on the outreach approach for 2022.
Cooperation and best practice sharing with agencies outside California (7.3.10.2)	Engage with agencies outside of California to exchange best practices and improvement, both for utility wildfire mitigation and for stakeholder cooperation to mitigate and respond to wildfires.

2022 WMP Initiative	2022 Activity Assessed by Energy Safety
Cooperation with suppression agencies (7.3.10.3)	Coordinate with CAL FIRE, federal fire authorities, county fire authorities, and local fire authorities to support planning and operations, including support of aerial and ground firefighting in real-time, including information-sharing, dispatch of resources, and dedicated staff.
Forest service and fuel reduction cooperation and joint roadmap (7.3.10.4)	Strategize and take actions to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).

5.2 Energy Safety Analysis of Substantial Vegetation Management Audits

Public Utilities Code section 8386.3(c)(5) requires Energy Safety to perform an audit to determine whether the electrical corporation "substantially complied with the substantial portion" of its vegetation management requirements in its WMP. Energy Safety refers to this audit as the Substantial Vegetation Management (SVM) audit. Pursuant to Public Utilities Code section 8386(c)(5), Energy Safety conducted an audit of Liberty's compliance with the vegetation management requirements in its 2022 WMP Update.

On August 13, 2024, Energy Safety issued its SVM Audit for Liberty. The purpose of the SVM Audit is to assess whether Liberty met the quantitative commitments and verifiable statements in its 2022 WMP Update related to vegetation management.

In the SVM Audit, Energy Safety found three instances where Liberty did not perform all required work. Liberty provided the necessary response in its Corrective Action Plan.

After reviewing Liberty's Corrective Action Plan, filed on September 12, 2024, Energy Safety issued its SVM Audit Report on October 10, 2024, finding that Liberty sufficiently addressed the issues identified for Corrective Action and that Liberty substantially complied with the substantial portion of the vegetation management requirements in its 2022 WMP Update.

The specific findings from Energy Safety's SVM Audit Report are described in Appendix D.

5.3 Energy Safety Field Inspection Analysis

Energy Safety performs inspections utilizing an electrical corporation's initiative activity data applicable to the WMP year compliance period. Energy Safety conducts two types of inspections: 1) inspections of grid hardening and other work related to WMP initiatives related to physical infrastructure, and 2) inspections of general wildfire safety conditions at an inspection site. The second category of general wildfire safety conditions is not strictly related to WMP initiatives, and these inspections are supplemental to Energy Safety's WMP initiative-related inspection work.[10]

In the tables below, Energy Safety distinguishes its inspection activities related to WMP initiatives on grid hardening and physical infrastructure (WMP Inspections) and inspection activities related to general wildfire safety conditions (GWS Inspections).

For the 2022 compliance period, Energy Safety conducted 5,261 GWS inspection activities and 1,167 WMP inspection activities in Liberty's territory. The results of these inspection activities are described in the tables below.[11] (Table 2, Table 3).

Table 2: Energy Safety's 2022 Observations of General Wildfire Safety Concerns in Liberty's Territory in 2022

GWS Inspection Metrics for 2022 in Liberty's Territory	Totals
Total GWS Inspection Activities	5261
Total Defects or Wildfire Safety Concerns Observed	6
Rate of Defects or Wildfire Safety Concerns Observed	0.11%
Defects Overdue for Correction	0
Defect Timely Correction Rate	100%

[10] If Energy Safety observes a general wildfire safety concern during an inspection activity, then that is recorded as a "defect" or "Wildfire Safety Concern (WSC)." If Energy Safety observes non-compliance with a WMP initiative during an inspection activity that an electrical corporation reported to have occurred at a site, then that is recorded as a "violation."

[11] Energy Safety uses the term "inspection activity" to refer to a specific question or condition assessed during an inspection. For example, if Energy Safety is inspecting a particular utility pole and looking for eight different conditions associated with a WMP initiative, then that would count as eight WMP inspection activities. If a general wildfire safety inspection occurs at the same time at that utility pole, and 20 general wildfire safety conditions are assessed, then that would count as 20 general wildfire safety inspection activities. In this example, a single utility pole inspection would lead to 28 inspection activities.

Table 3: Energy Safety's Observations of Wildfire Mitigation Plan Violations in Liberty's Territory in 2022

WMP Inspection Metrics for 2022 in Liberty's Territory	Totals
Total WMP Inspection Activities	1,167
Total Violations Observed	8
Violation Rate	0.69%
Violations Overdue for Correction	0
Violation Timely Correction Rate	100%

5.4 Liberty's WMP Initiative Activity Attainment in 2022

As noted previously, Energy Safety's evaluation of Liberty's performance in 2022 indicates that Liberty attained 61 of its 68 initiative activities. Liberty did not attain five of the seven initiative activities, and did not provide sufficient information for Energy Safety to draw a conclusion about two initiative activities.

The table below, Table 4, summarizes all of the 2022 WMP Update initiative activity targets that Liberty did not meet in 2022, or for which insufficient information was provided by Liberty. This is based on the analysis of Liberty's EC ARC, the IE ARC, Energy Safety's independent examination of Liberty's transmission and distribution system, as well as data submitted by Liberty in response to Energy Safety data requests and otherwise for the 2022 compliance year. Based on its analysis, Energy Safety finds that any activity not described in the table below was met for the 2022 compliance year.

Table 4 below outlines the missed initiative activities, providing details of non-attainment, rationale, and an analysis of the initiative activities associated under expenditures (if applicable). Expenditure details for these initiative activities and more are located in Appendix C of this document for reference.

Table 4: Liberty's Non-Attainment of WMP Initiative Activities

2022 WMP Update Initiative	2022 Initiative Activity	Details of Non-Attainment and Rationale
Advanced weather monitoring and weather stations (7.3.2.1)	Install 10 weather stations.	Liberty did not have the proper equipment or personnel available to perform the installations until the fall of 2022. Winter weather conditions did not allow for project completion due to inaccessibility with snowpack. Liberty completed the installation of five out of 10 weather stations. (IE ARC, p. 44.)

2022 WMP Update Initiative	2022 Initiative Activity	Details of Non-Attainment and Rationale
Fault indicators for detecting faults on electric lines and equipment (7.3.2.3)	Install two circuits with fault indicators.	Liberty's EC ARC did not report on initiative activity completion but did report on its expenditure for this initiative. Although there was no planned expenditure in its 2022 WMP Update, Liberty documented $50,000 was spent on this initiative work. (EC ARC, p. 13.) The IE ARC noted that the IE could not confirm the locations of the fault indicators. (IE ARC, p. 7.) Liberty did not clearly report on the two circuits with fault indicators in response to a data request for this initiative. (DR 250.) Therefore, there was insufficient information to make a conclusion regarding this initiative.
Weather forecasting and estimating impacts on electric lines and equipment (7.3.2.6)	Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision making, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.	Liberty provided dates for numerous meetings in collaboration with REAX, Liberty's fire science consultant, however this is not sufficient information to make a determination of attainment as that does not demonstrate whether Liberty developed the forecasting tools mentioned in the WMP. (LU DR 250.)

2022 WMP Update Initiative	2022 Initiative Activity	Details of Non-Attainment and Rationale
Installation of system automation equipment (7.3.3.9)	Install four-line reclosers.	The automatic reclosers were delayed due to access issues caused by snow and avalanche danger. Liberty completed the installation of two of the four reclosers. (EC ARC, p. 6.) This initiative was underfunded by 47%. (EC ARC p. 14.)
Undergrounding of electric lines and/or equipment (7.3.3.16)	Complete 0.36[12] miles of undergrounding in addition to Rule 20 undergrounding projects.	In 2022, Liberty completed 0.24 miles of undergrounding. Liberty stated that two of three undergrounding projects were delayed due to permitting issues. (EC ARC, p. 14.) This initiative was underfunded by 93%. (EC ARC, p. 14.)
Patrol inspections of distribution electric lines and equipment (7.3.4.11)	Complete 706[13] miles of inspections.	In 2022, Liberty completed 503 miles of inspections. Liberty states that its target of 706 miles was erroneously established and should have been closer to 503 miles. (EC ARC 2022, p. 14.)

[12] While Section 7.3.3.16 of the WMP states a target of 0.37 miles, Table 5.3-1 of the WMP, as well as Table 12 of the QDR, state a target of 0.36 miles.
[13] The 2022 Q1 QDR Table 12 target of 70 units is presumed to be a clerical error based on the target in Table 5.3-1 from the 2022 WMP Update of 706 miles.

2022 WMP Update Initiative	2022 Initiative Activity	Details of Non-Attainment and Rationale
Quality assurance / quality control of inspections (7.3.4.14)	Complete inspections on 0.5% of circuit miles. A qualified third-party contractor will be selected in order to validate that inspections are conducted in an effective manner in compliance with G.O. 165 inspection process and G.O. 95 construction standards.	In 2022, Liberty completed inspections on 0.44% of its circuit miles and did not provide an explanation for this missed target. (EC ARC, p. 7.) This initiative was apparently underfunded by 100%, due to lack of documentation and tracking of financial progress. (EC ARC, p. 16). While presumably some expenditure was made to conduct the reported inspections, the amount of this expenditure is unknown.

Energy Safety finds that Liberty sufficiently completed work in areas that Liberty described as its "areas of focus" (which Energy Safety interprets to be its key objectives) from its 2022 WMP Update, as described in Section 2 of this report and listed below.

- Continue grid hardening initiatives,
- Increase use of situational awareness tools,
- Enhancement of data collection and analytics to inform reporting,
- Risk modeling and decision-making,
- Improvement of asset management and inspections processes, and
- Increase preparedness for Public Safety Power Shutoff (PSPS) events.

While some of the initiative activities geared at achieving these objectives were not met, such as the planned activity to install 10 weather stations that would have led to improved situational awareness, Liberty's attainment of 90% of its planned initiative activities demonstrates that it sufficiently completed work in its areas of focus for 2022.

Liberty has improved its wildfire risk assessment and mitigation programs, including surpassing tree removal targets.

Taken together, this information demonstrates that Liberty successfully implemented the majority of its planned activities within its 2022 WMP Update.

6. Wildfire Risk Reduction: Performance Metrics, Inspections by Liberty, and Overall WMP Execution

The Compliance Process applicable to the 2022 WMP compliance year defines goals for Energy Safety that extend beyond assessing compliance with WMP initiatives. Specifically, Energy Safety examines the ultimate performance of an electrical corporation's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk. Energy Safety also considers whether the electrical corporation exhibited issues related to its execution, management, or documentation in the implementation of its WMP.

Below, this report outlines the metrics chosen by Energy Safety to evaluate the performance of an electrical corporation's infrastructure relative to risk. These metrics include data on ignitions and PSPS events in the territory of the electrical corporation. The data utilized by Energy Safety were provided by Liberty in its QDR submissions; but were analyzed and presented here using Energy Safety's own methodology. Where necessary, explanations of Energy Safety's methodology are provided.

This section also contains Energy Safety's analysis of Liberty's own asset inspection regime, as well as a discussion of any issues exhibited by Liberty with respect to its execution, management, or documentation in the implementation of its WMP, if applicable.

6.1 Ignition Risk and Outcomes Metrics

Energy Safety assessed the performance of Liberty's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk.

Energy Safety requires electrical corporations to report data, such as ignitions in the HFTD, that help Energy Safety assess whether an electrical corporation reduced its wildfire risk while also reducing its reliance on PSPS. In 2022, Energy Safety assessed each electrical corporation's infrastructure performance for the calendar years 2015 through 2022 with particular attention on the 2022 outcomes.

The collection of metrics evaluated are grouped into two categories: Ignition Risk Metrics, and Outcome Metrics. A list of all the metrics in each category is described fully in their respective following sections. For these sections, Energy Safety relied on data reported in the fourth quarter 2023 QDR for the year 2022 values and third quarter 2022 QDR for all prior year values. (2023 Q4 QDR, 2022 Q3 QDR.)

Normalizing Metrics:

For applicable performance metrics, the normalizing metrics Energy Safety uses are: "Overhead Circuit Miles" (OCM), "High Wind Warning Overhead Circuit Mile Days (High Wind Warning Days or HWWOCMD), and "Red Flag Warning Overhead Circuit Mile Days" (Red Flag Warning Days or RFWOCMD). To see the values for each year used, see Appendix E, (Figure 18 through Figure 20). (2022 Q3 QDR, Tables 6 and 8; 2023 Q4 QDR, Tables 4 and 7.)[14]

Energy Safety uses these normalizing metrics to ensure a more nuanced interpretation of wildfire risk outcomes. For example, the outcome metric of "acres burned" is impacted directly by the presence of hot dry winds and, thus, this metric is presented in both raw counts and normalized by RFWOCMD. In this way, the acres burned are presented "accounting for" year by year variances in weather conditions that directly influence the outcome.

Findings:

Ignition risk and outcomes metrics findings include:

- The number of ignitions that occur annually on Liberty's equipment averaged approximately one per year from 2015 to 2022.
- Liberty raw wire down event counts increased in the most recent two years compared to 2015-2020. However, when accounting for the weather, the raw wire down event count increase observed in 2021-2022 does not appear as large.
- Liberty's unplanned outage counts began increasing in 2018 compared to previous years, but this increase does not appear as large when accounting for weather.
- Liberty had one PSPS event in 2018 and has not had another one as of the conclusion of the 2022 compliance period.
- For 2022, Liberty reported no acres burned, no injuries or fatalities, no structures destroyed, and no value of assets lost.

6.1.1 Ignition Risk Metrics

Energy Safety reviewed the following metrics associated with ignition risk:

1. *Ignitions* – Incidents in which electrical corporation infrastructure was involved,
2. *Wire Down Events* – Incidents in which overhead electrical lines fall to the ground, land on objects, or become disconnected from their moors,

[14] Since the format of the required data reporting of all electrical corporations changed near the end of 2022, all data for 2015-2021 are obtained from the Q3 2022 reporting (old format) and all data for 2022 are obtained from Liberty's Q4 2023 reporting (new format).

3. *Unplanned Outages* – All unplanned outages experienced,
4. *Vegetation-Caused Outages* – A subset of unplanned outages experienced in which the cause was determined to be vegetation contact with electrical lines,
5. *PSPS Events* – Planned outages called public safety power shutoff (PSPS) events.

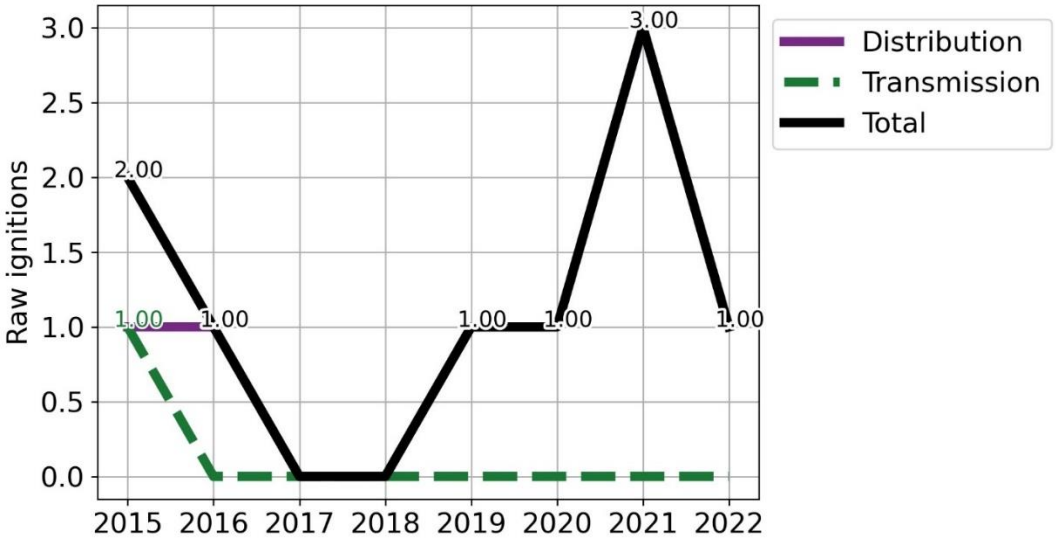
6.1.1.1 Ignition Data Analysis

The Ignition Data Analysis section examines ignitions stemming from distribution and transmission lines located focusing on Tier 2 and 3 HFTD areas (2023 Q4 QDR, Table 6; 2022 Q3, Table 7.2.). In addition to showing raw ignition counts, ignitions are normalized by Overhead Circuit Miles (OCM), High Wind Warning Overhead Circuit Miles days (HWWOCMD), and Red Flag Warning Overhead Circuit Days (RFWOCMD). Liberty's service territory is divided into three primary area designations: Non-HFTD, HFTD Tier 2, and HFTD Tier 3. For a sense of scale, the percent of each territory type in Liberty's service area is as follows: Non-HFTD = 37%, HFTD Tier 2 = 62%, and HFTD Tier 3 = 1%. (2022 Q3 QDR, Tables 6 and 8; 2023 Q4 QDR, Tables 4 and 7.)

Raw Ignition Counts:

Distribution ignition counts were very low across years. The lowest number in 2017 and 2018 is zero and the highest in 2021 is three (Figure 1). So, the dynamics of the plot are misleading as differences between years of only one or two ignitions is not material. All the ignitions except for one in 2015 were on the distribution lines. This shows the ignitions for Liberty continue to be low from 2015 to 2022 with an average over the period of approximately one per year.

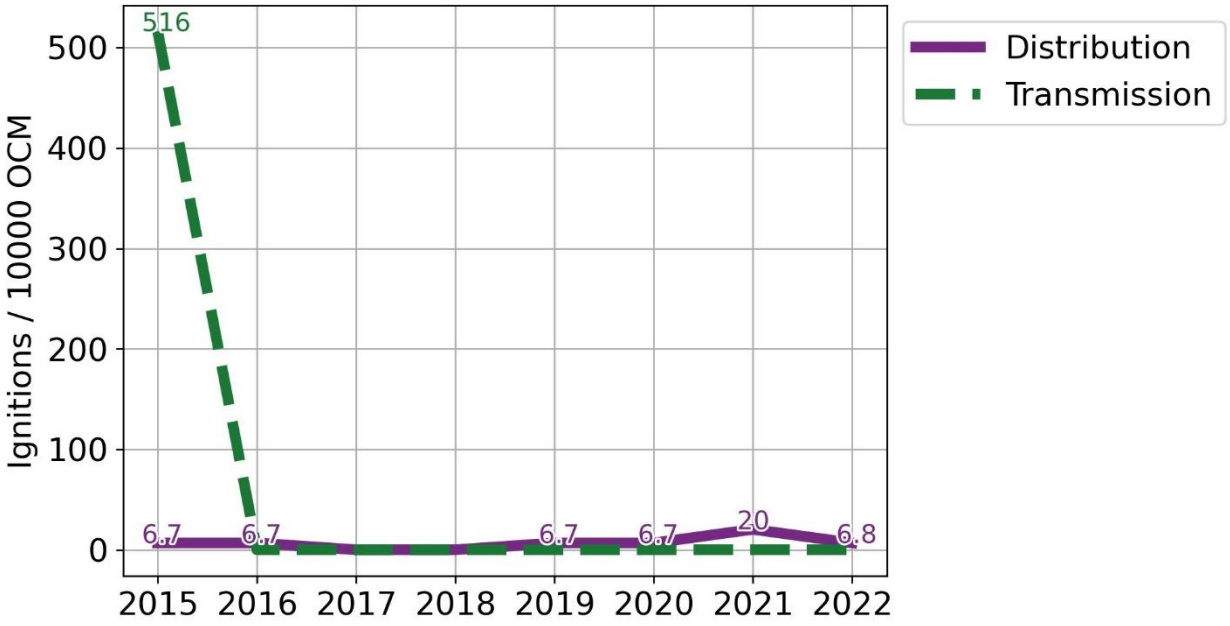
Figure 1: Liberty Ignition Counts (2015-2022) by Distribution and Transmission Lines



Ignitions Normalized by Overhead Circuit Miles:

To account for concurrent grid expansion within the territory,(Figure 2) reflects ignitions normalized by overhead circuit miles (OCM) and delineated by distribution and transmission lines (Figure 2). The number of distribution ignitions normalized by OCM are generally constant over the same period with some slight fluctuations in 2021. The transmission lines comprise only a small percentage of the total circuit miles and so only one transmission ignition in 2015 normalizes to a relatively large number. Consequently, in this instance, the normalized ignition data is not meaningful.

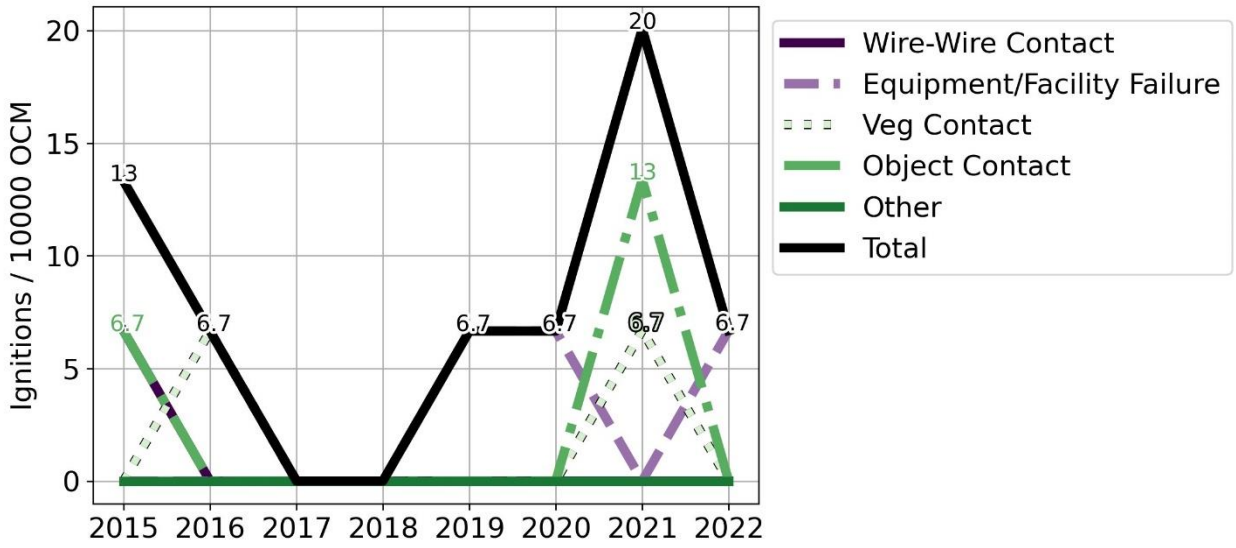
Figure 2: Liberty Ignitions Normalized by Overhead Circuit Miles (2015-2022) by Distribution and Transmission Lines



Ignitions Normalized by Overhead Circuit Miles Delineated by Risk Driver:

From 2015 to 2020, ignitions due to equipment and facility failure primarily drive the normalized ignition rate. From 2020 to 2022, ignitions due to object contact and vegetation contact primarily drive the normalized ignition rate (Figure 3). With small overall raw counts, it is difficult to draw a conclusion from these observations.

Figure 3: Liberty Ignitions Normalized by Overhead Circuit Miles (2015–2022) and by Risk Drivers



Ignitions by HFTD Tier and normalized by High Wind Warning Overhead Circuit Mile Days and Red Flag Warning Overhead Circuit Mile Days:

To see more detail on ignitions by Risk Driver for each HFTD level for distribution lines and then transmission lines as well as all ignition analyses normalized by HWWOCMD and RFWOCMD, see Appendix E (Figure 21 to Figure 29).

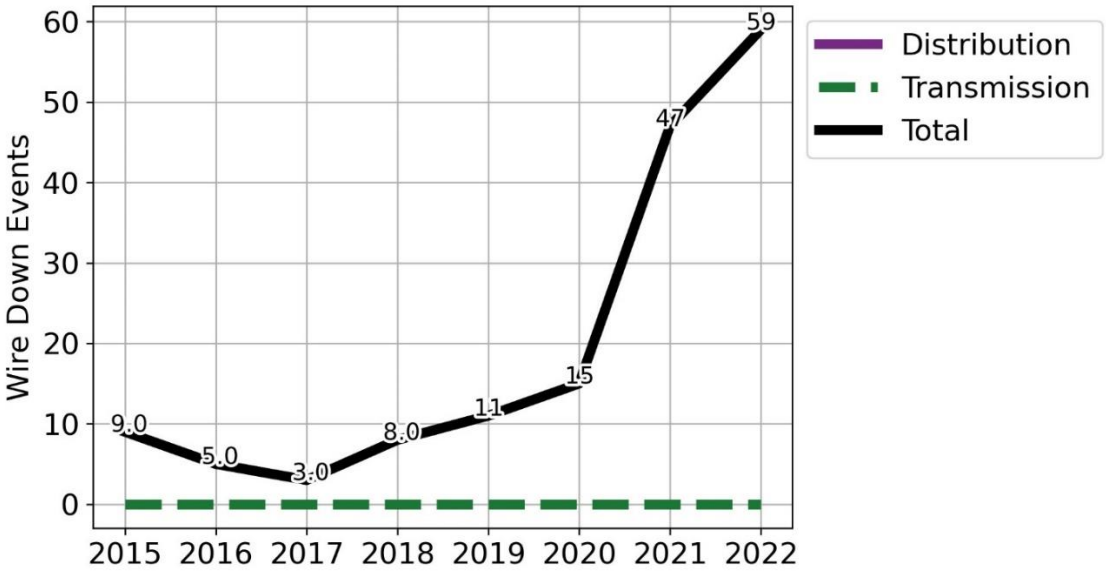
6.1.1.2 Wire Down Events Data Analysis

Wire down events are wildfire risks where a wire is touching the ground, an object, or has become disconnected from its mooring. This type of event poses a risk of ignition or a danger to people if the down wire is energized with electricity. The data source for wire down information is the QDR. (2022 Q3 QDR, Table 7.1; 2023 Q4 QDR, Table 5.)

Raw Wire Down Events:

In terms of absolute event numbers, wire down events and unplanned outages increased in 2022, both in comparison to 2021 as well as the 2015-2020 period (Figure 4). Liberty's wire down events are relatively high in the last two years.

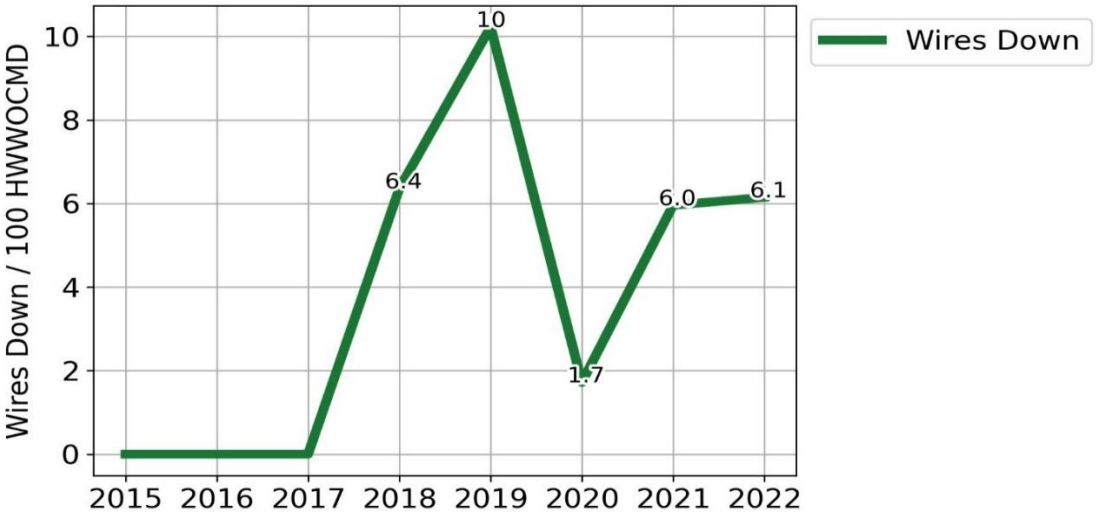
Figure 4: Liberty Count Wire Down Event Counts (2015-2022) by Distribution and Transmission Lines



Wire Down Events Normalized by High Wind Warning Overhead Circuit Mile Days:

When accounting for weather, normalized wire down events per HWWOCMD do not show the increase in 2021 and 2022 (Figure 5). This indicates that the increases Liberty observed in raw wire down event counts for 2021 and 2022 may be explained by the weather.

Figure 5: Liberty Total Wire Down Events from Normalized by HWWOCMD (2015–2022)



Wire Down Events Normalized by Red Flag Warning Overhead Circuit Mile Days:

Please see Appendix E (Figure 29) for wire down events normalized by RFWOCMD.

6.1.1.3 Outage Event Data Analysis

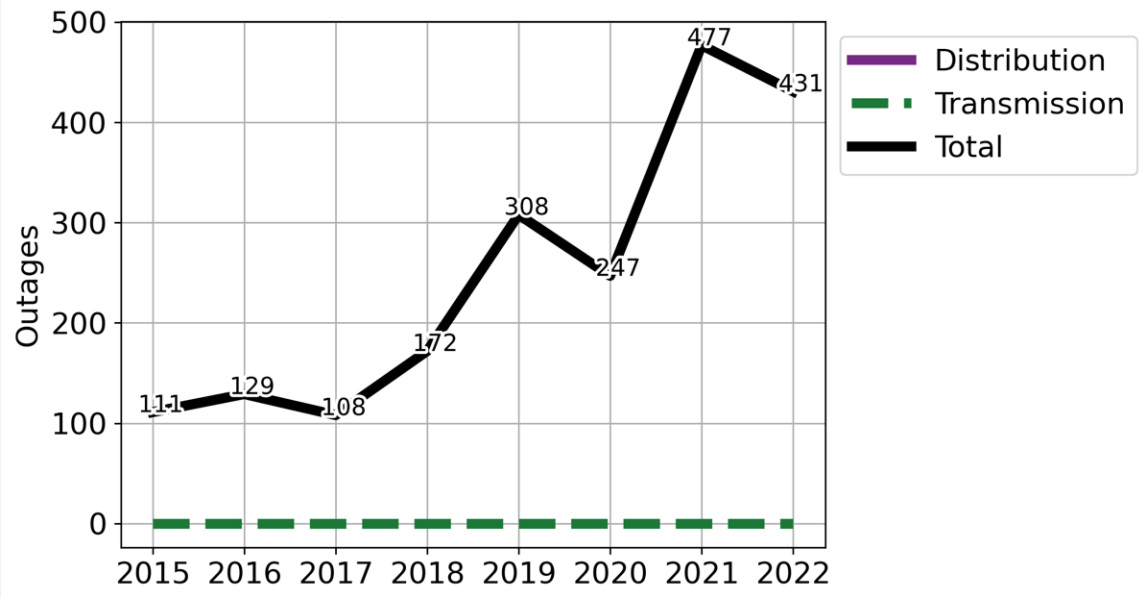
Power outages (outages) are unplanned outage events (not including PSPS events) tabulated by circuit counts. Outage events are tracked as outcomes that may cause ignitions and impact customers' quality of life.

The data source for outage event information is the QDR. (2022 Q3 QDR, Table 7.1; 2023 Q4 QDR, Table 5.)

Raw Outage Event Counts:

Total unplanned outage event counts fluctuated on the distribution system between 2015 and 2022 but show a general increase in counts starting in 2018. Outages did not occur on the transmission system between 2015 to 2022 (Figure 6). This shows Liberty has an increasing number of unplanned outages starting in 2018.

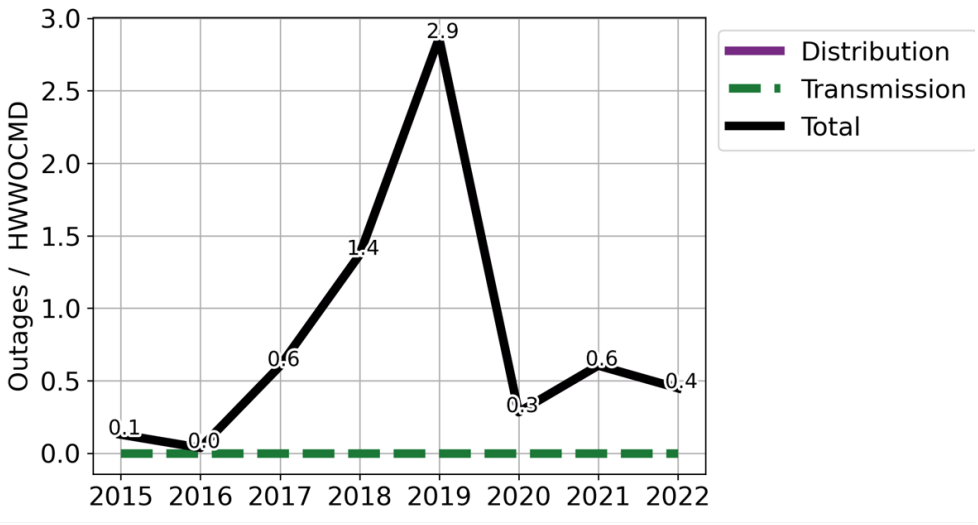
Figure 6: Liberty Count of Outage Events (2015–2022) By Distribution and Transmission Lines



Outage Events Normalized by High Wind Warning Overhead Circuit Mile Days:

To view the outage event trends with respect to weather patterns, outage event counts have been normalized by HWWOCMD. This adjustment accounts for year-to-year weather variations. Apart from the very high distribution line value shown in 2019, which is caused by a low number of HWWOCMD for that year, there is no upward pattern in the weather adjusted outage events. There were zero outages on the transmission system (Figure 7). This shows that the Liberty upward pattern in raw ignitions is explained when accounting for the weather.

Figure 7: Liberty Outages Normalized by HWWOCMD (2015-2022) by Distribution and Transmission lines



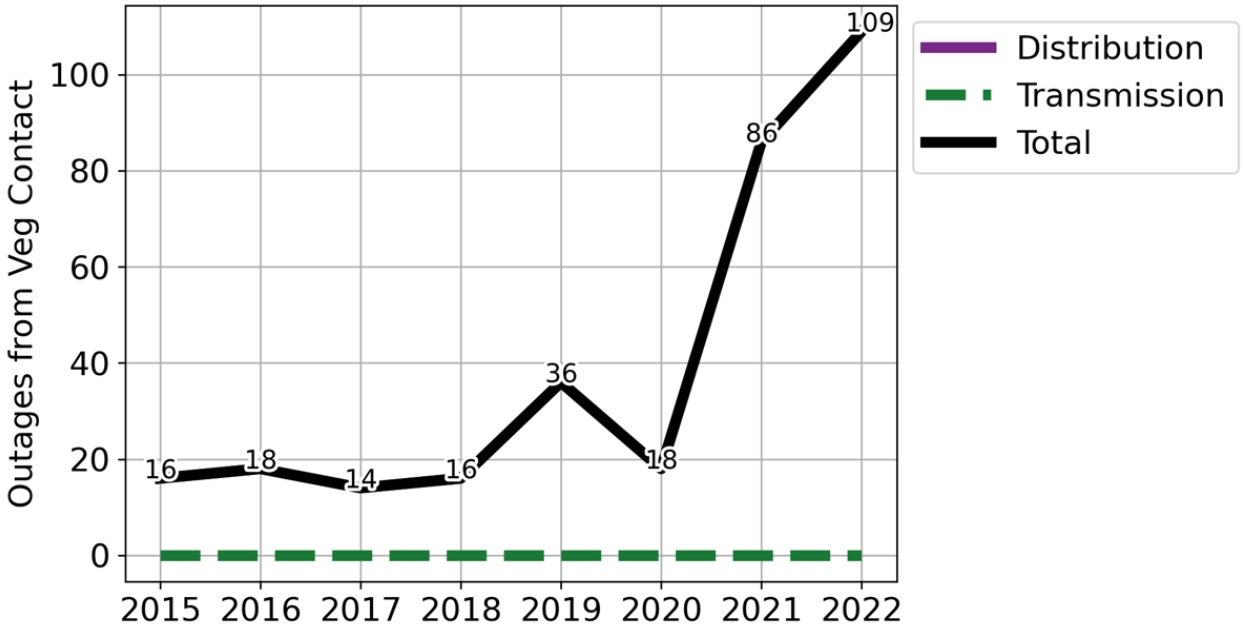
Outage Events Normalized by Red Flag Warning Overhead Circuit Mile Days:

Please see Appendix E (Figure 30) for outage events normalized by RFWOCMD.

Outage events from vegetation contact counts:

Among the reasons for unplanned outage events, vegetation contact is one of the most common. It is presented separately from other risk drivers below. While the number of these vegetation-related outages fluctuated over the years, a dramatic peak occurred in 2022 where vegetation contact accounted for almost 25% of all outage events (Figure 8).

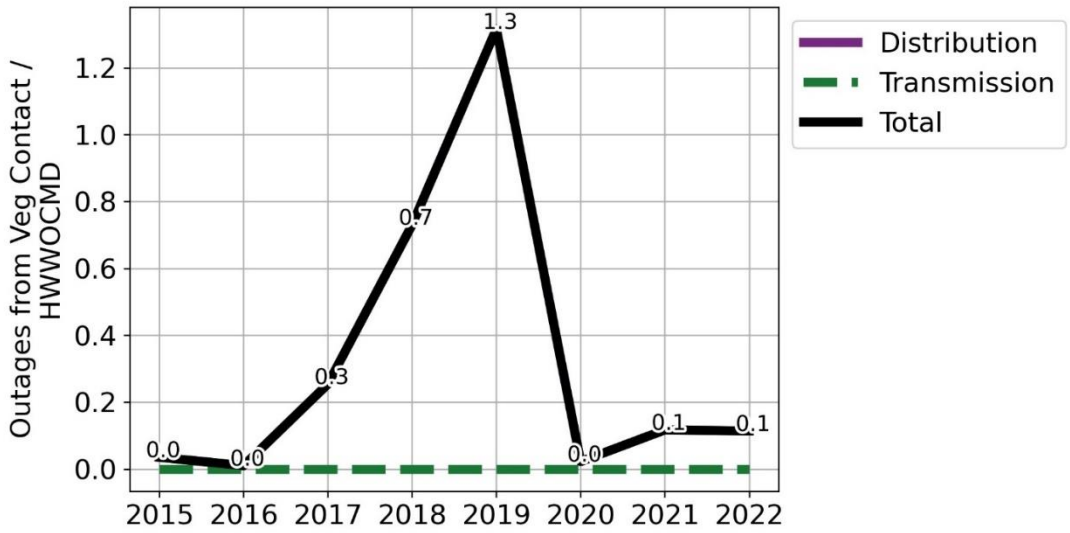
Figure 8: Liberty Count of Outages from Vegetation Contact (2015-2022) by Distribution and Transmission Lines



Outage Event from Vegetation Contact Counts Normalized by High Wind Warning Overhead Circuit Mile Days:

As outage events caused by vegetation contact may correlate with weather conditions, the raw counts were normalized by HWWOCMD. Other than the very high value on distribution lines in 2019, caused by very low HWWOCMD in that year, there is no upward pattern (Figure 9). This means that when accounting for the weather, the Liberty increase in raw counts of outage events caused by vegetation is explained by the weather.

Figure 9: Liberty Outages from Vegetation Contacts Normalized by HWWOCMD (2015–2022) by Distribution and Transmission Lines



Outage Events from Vegetation Contact Counts Normalized by Red Flag Warning Overhead Circuit Mile Days:

Please see Appendix E (Figure 31) for outage events caused by vegetation contact normalized by RFWOCMD.

6.1.1.4 Public Safety Power Shutoff Event Data Analysis

Public Safety Power Shutoffs (PSPS) are planned outages implemented by utilities as a wildfire prevention measure during extreme fire conditions, such as hot, dry, and windy weather. While effective in mitigating wildfire risk, PSPS events can have negative impacts, especially on vulnerable customers reliant on electricity. Utilities work to minimize the frequency, scope, duration, and impact of these events.

To analyze PSPS outcomes, data is presented in both raw counts and normalized by weather conditions (using RFWOCMD) to account for year-to-year weather variations.

The following four PSPS event parameters are presented for each year and compromise the PSPS event data analysis.

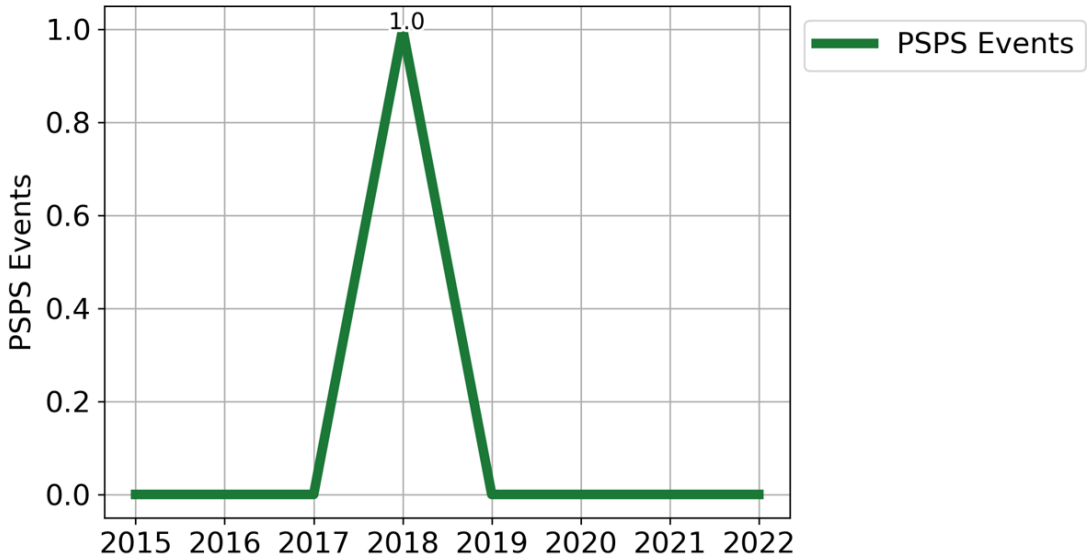
- *Frequency* - The number or count of all PSPS events,
- *Scope* - The total number of utility circuits impacted because of all PSPS events,
- *Duration* - The total number of customer-hours because of all PSPS events, and
- *Impacts* - The number of critical infrastructure locations-hours impacted by all PSPS events.

The data source for PSPS events information is the QDR. (2022 Q3 QDR, Table 11; 2023 Q4 QDR, Table 10.)

Frequency of PSPS Events

Liberty had one PSPS event in 2018 and has not had another PSPS event through 2022. Therefore, this section of the ARC will not further analyze PSPS parameters (Figure 10).

Figure 10: Liberty Frequency of PSPS Events Total (2015-2022)



6.1.2 Outcome Metrics

This section presents outcome metrics on electrical corporation-related wildfires including:

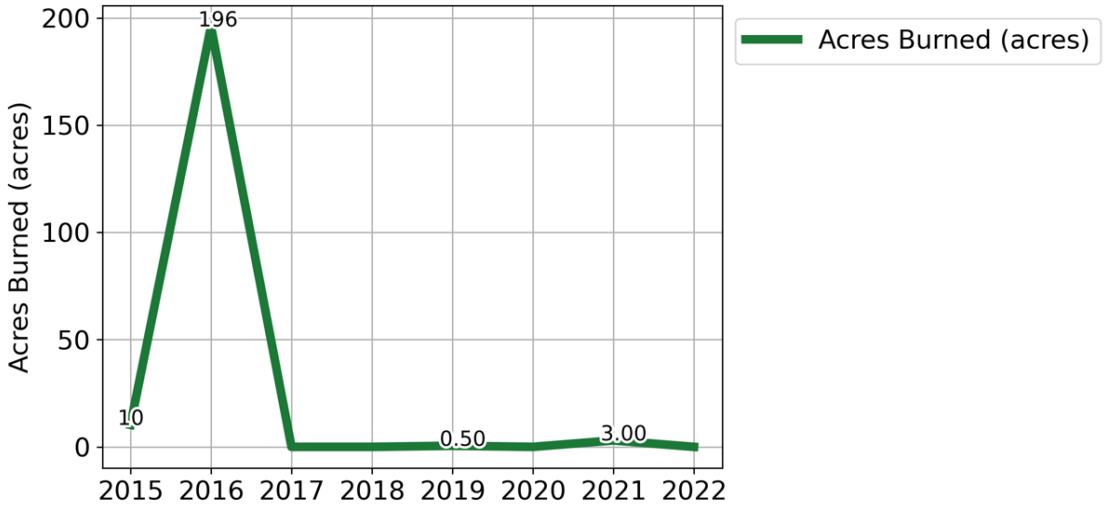
1. *Acres burned* – The total number of acres burned due to electrical corporation caused fires,
2. *Structures damaged/destroyed* - The total number of structures damaged or destroyed due to electrical corporation caused fires,
3. *Injuries/fatalities* - The total number of injuries and fatalities due to electrical corporation caused fires,
4. *Value of assets destroyed* - The total value of assets destroyed due to electrical corporation caused fires.

The data source for outcomes metrics information is the QDR. (2023 Q4 QDR, Table 2; 2022 Q3 QDR, Table 2.)

Acres Burned:

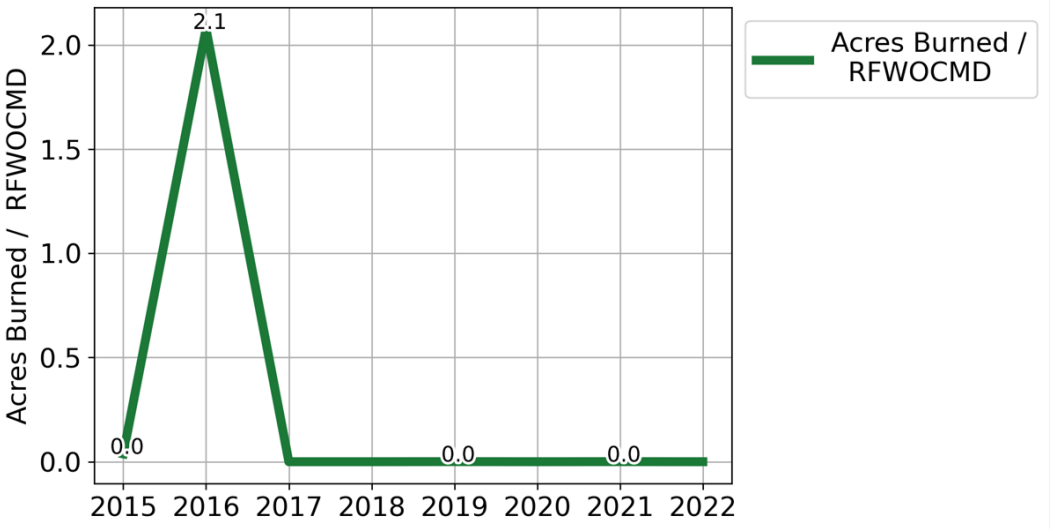
Acres burned had a relatively high value of 196 in 2016. Since then, acres burned were zero with exception of 2019 (half of an acre) and 2021 (three acres). In 2022 acreage burned is reported at zero (Figure 11).

Figure 11: Liberty Total Acres Burned (2015-2022)



When accounting for yearly variance in the weather, the acres burned normalized by RFWOCMD showed a similar trend as the raw acres burned (Figure 12).

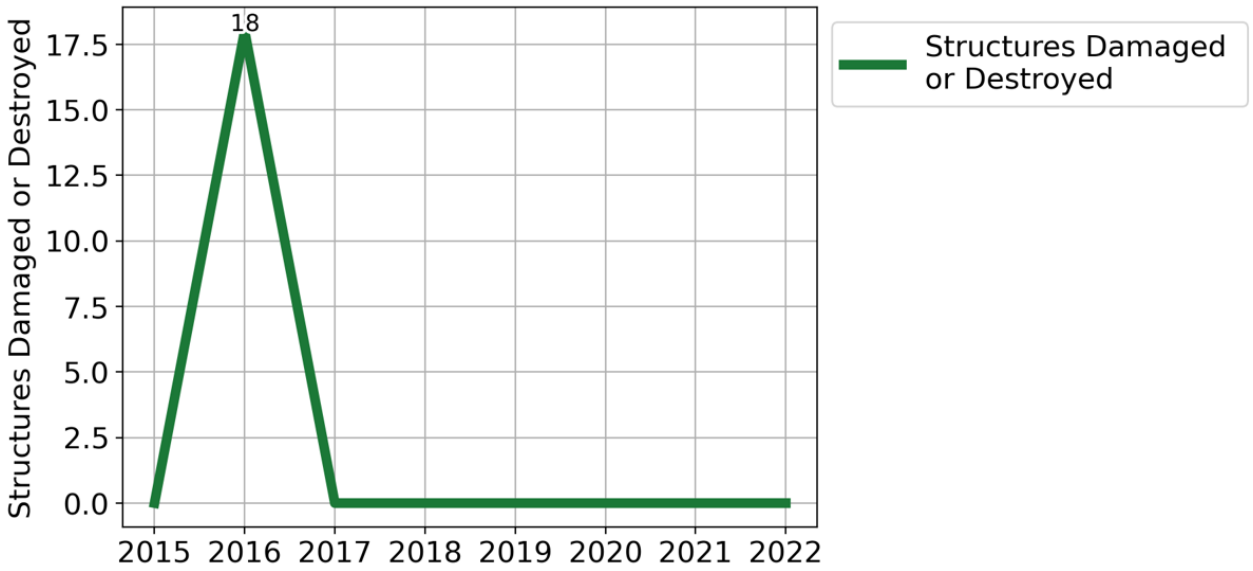
Figure 12: Liberty Total Acres Burned Normalized by RFWOCMD (2015-2022)



Structures Damaged:

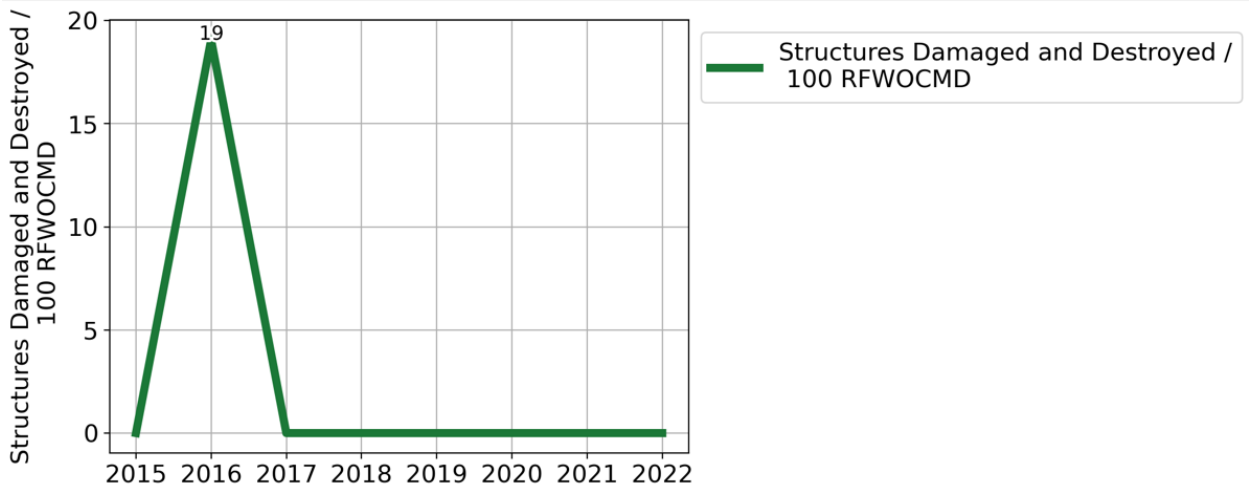
Liberty has only reported structure destruction once, with 18 structures destroyed in 2016 (Figure 13).

Figure 13: Liberty Structures Damaged or Destroyed (2015-2022)



The number of structures damaged or destroyed by Liberty-ignited wildfires between 2015 and 2022 is 18, which occurred solely in 2016 (Figure 13). When accounting for variances in yearly weather by normalizing by RFWOCMD, the same pattern is observed (Figure 14).

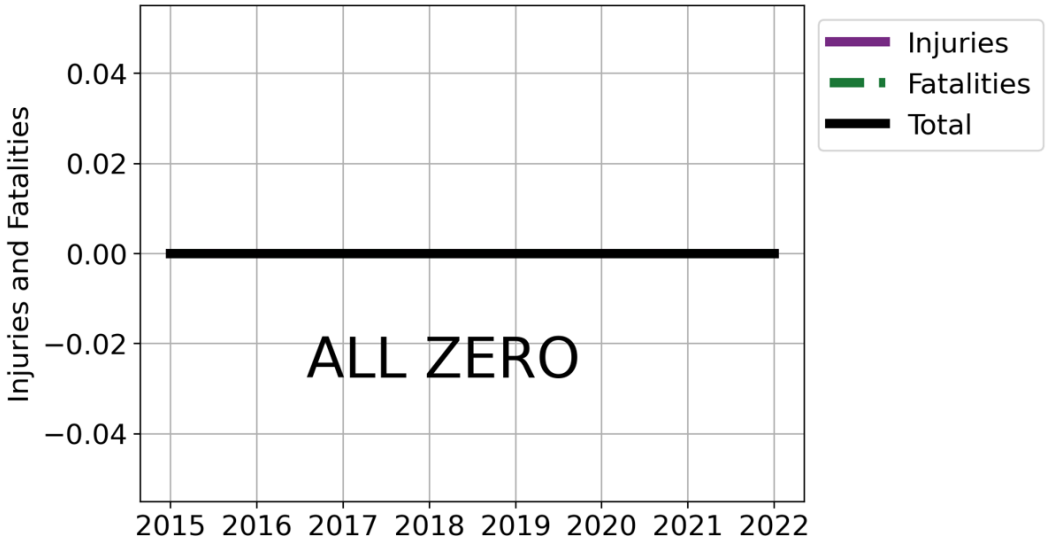
Figure 14: Liberty Structures Damaged or Destroyed Normalized by RFWOCMD (2015-2022)



Injuries and Fatalities:

No fatalities or injuries were reported in 2022, along with the previous seven years (Figure 15).

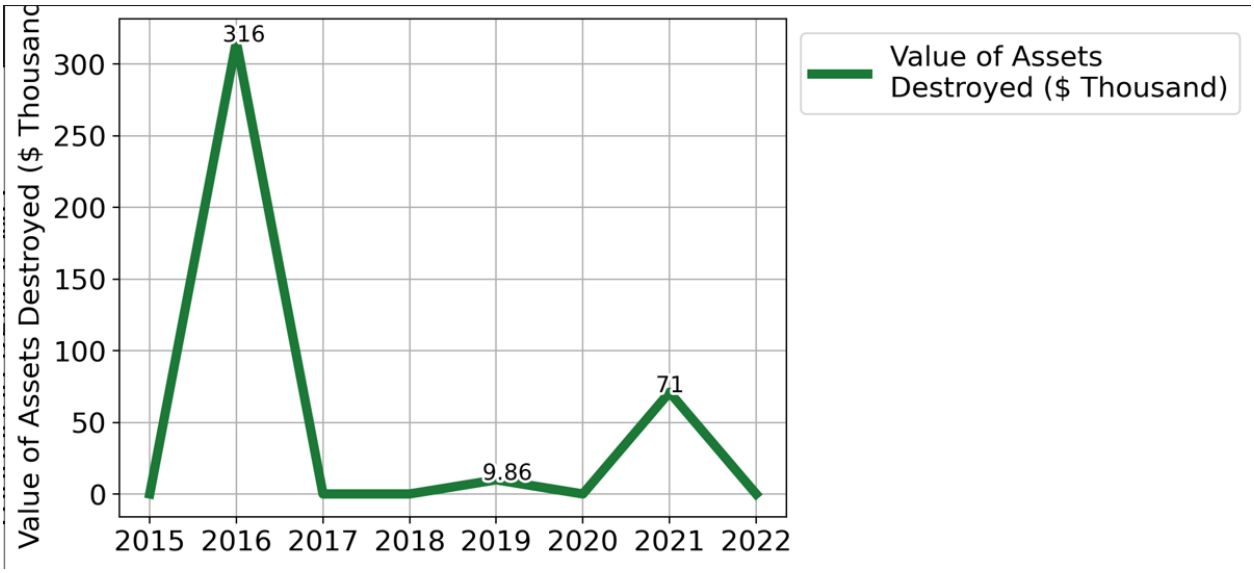
Figure 15: Liberty Injuries and Fatalities (2015-2022)



Value of Destroyed Assets:

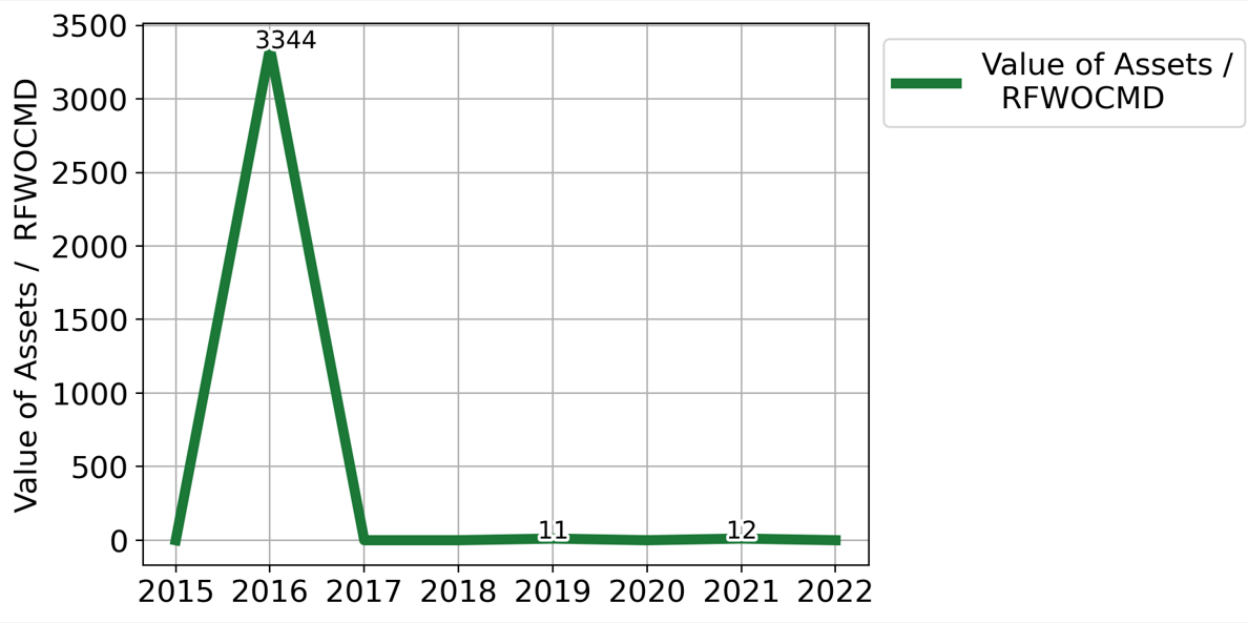
Liberty's value of destroyed assets peaked in 2016, and experienced stability until 2019, with an increase in 2021. Zero assets were reported as destroyed in 2022 (Figure 16).

Figure 16: Liberty Value of Destroyed Assets (2015–2022)



Liberty's value of destroyed assets normalized by RFWOCM show a similar trend as when not normalized, except in 2021 where the results are much lower (Figure 17).

Figure 17: Liberty Value of Destroyed Assets Normalized by RFWOCMD (2015 -2022)



6.2 Issues Related to Liberty's Execution, Management, or Documentation of its WMP Implementation

Liberty submitted reports to Energy Safety, such as the EC ARC and the QDRs, to inform Energy Safety's evaluation of Liberty's compliance with its 2022 WMP Update initiative activities. These reports were occasionally incomplete. Energy Safety needed to seek more information from Liberty or review other source documentation to determine Liberty's compliance with several of its WMP initiative activities.

For 19 of its WMP initiatives, Liberty did not report the actual activity completion, impairing Energy Safety's ability to clearly understand if initiatives activities had been completed or not. A list of these initiatives is included in Appendix A, Table A-2. Therefore, Liberty did not adequately document its WMP implementation. Liberty must improve its WMP implementation documentation going forward.

7. Conclusion

Energy Safety's evaluation determined that Liberty completed 61 out of 68 (90%) of its 2022 WMP Update initiative activities. Significantly, Liberty exceeded targets that play a role in reducing risk and as well as those that advanced its approaches to risk modelling and operations.

As previously discussed, Liberty failed to achieve targets for five initiatives, and did not supply information sufficient to support a conclusion on targets for two initiatives, intended to

reduce the risk of utility-caused wildfires. Liberty faced challenges due to circumstances including weather, equipment defects, and permitting processes. Liberty must account for these factors in planning and executing its WMP initiative activities in the future.

Energy Safety found that Liberty's missed targets did not significantly hinder Liberty's ability to mitigate its wildfire risk. Data supported Liberty's stable performance with respect to risk events and outcomes. On balance, Liberty was largely successful in executing an actionable and adaptive plan for wildfire risk mitigation.

While Energy Safety acknowledges that Liberty achieved its overarching objectives, there are still areas for improvement and continued learning, primarily as it relates to asset and vegetation inspections, and properly documenting initiative progress for the year.

8. References

Reference	Citation
2022 WMP Update	Liberty Utilities, "Wildfire Mitigation Plan," May 6, 2022. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52685&shareable=true.
Compliance Process	Office of Energy Infrastructure Safety, "2022 WMP Compliance Process," Oct. 2022. Available: https://energysafety.ca.gov/wp-content/uploads/2022-wmp-compliance-process.pdf.
EC ARC	Liberty Utilities, "Annual Report on Compliance Regarding Compliance with its 2022 WMP Update," Mar. 31, 2023. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53590&shareable=true.
IE ARC	Bureau Veritas North America, Inc., "2022 Wildfire Mitigation Plan Independent Evaluator Annual Report on Compliance," Jun. 30, 2023. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54382&shareable=true.
LU DR 250	Liberty Utilities "Energy Safety DR-250_Liberty Response," Jul. 17, 2024.
2022 Q3 QDR	Liberty Utilities, "Liberty 2022 Q3 QDR," Nov. 1, 2022. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53178&shareable=true.
2022 Q4 QDR	Liberty Utilities, "Liberty 2022 Q4 Tables (1-15)," Feb.1, 2022. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53365&shareable=true.
2023 Q4 QDR	Liberty Utilities, "Liberty 2023 Q4 Tables1-15 R0," Feb.14, 2024. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56313&shareable=true.

Reference	Citation
Ops Protocols	California Public Utilities Commission, "Compliance Operational Protocols," Feb. 16, 2021. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52615&shareable=true.
Public Util. Code § 8386	Public Utilities Code Section 8386 https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=8386.&lawCode=PUC.
SVM	Office of Energy Infrastructure Safety, "Liberty 2022 Substantial Vegetation Management Audit," Aug. 13, 2024. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=57195&shareable=true.
SVMAR	Office of Energy Infrastructure Safety, "Liberty 2022 Substantial Vegetation Management Audit Report," Oct. 10, 2024. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=57501&shareable=true.
LU SVMAP	Liberty Utilities, "Liberty 2022 SVM Audit Corrective Action Plan Response," Sep. 12, 2024. Available: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=57362&shareable=true.

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APPENDICES

9. Appendices

Appendix A: Liberty's Planned Activities in its 2022 WMP Update

Energy Safety receives data from the electrical corporations in the form of Quarterly Data Reports (QDR). These QDR submissions include information on the electrical corporation's progress toward meeting quantitative WMP initiatives. By analyzing the entire QDR dataset for 2022, Energy Safety can determine if the electrical corporation's data reflect attainment or non-attainment of quantitative WMP initiatives. Qualitative WMP initiatives are not considered in this analysis.

Where there is dissonance between the assertions of an electrical corporation in its Annual Report on Compliance and Energy Safety's analysis of the QDR data, Energy Safety requests information from the electrical corporation to explain non-attainment of a quantitative WMP initiative. Where there is agreement between the electrical corporation's Annual Report on Compliance and the QDR data on attainment of quantitative WMP initiatives, no information related to the QDR analysis is requested.

Below, Table 5 illustrates where there are differences in how Liberty's initiative performance is reported in its QDR, EC ARC, and in the IE ARC.

Table 5: Liberty's Quantitative WMP Initiative Activities

2022 WMP Initiative Activity	QDR Attainment Status	EC ARC Attainment Status	IE ARC Status	Dissonance
Advanced weather monitoring and weather stations (7.3.2.1) Target: 10	Not Met Target: 10 Actual: 5	Unknown No Data provided	Not Met Target: 5 Actual: 4	Conflicting targets between QDR and EC ARC.
Continuous monitoring sensors (7.3.2.2) Target: 10	Met Target: 10 Actual: 10	Unknown No Data provided	Unknown No Data provided	QDR indicates a quantitative initiative, while WMP indicates a qualitative initiative. No reporting in the EC ARC.

2022 WMP Initiative Activity	QDR Attainment Status	EC ARC Attainment Status	IE ARC Status	Dissonance
Fault indicators for detecting faults on electric lines (7.3.2.3) Target: 2	Met Target: 2 Actual: 2	Unknown No data provided	Not Met Target: 2 Actual: 1	IE verified one of two circuits.
Circuit breaker maintenance and installation to deenergize lines upon detecting a fault (7.3.3.2) Target: 1 circuit	Unknown No data provided	Unknown No data provided	Met Target: 1 Actual: 1	QDR and EC ARC do not report on target established in WMP.
Additional efforts to manage community and environmental impacts (7.3.5.1) Target: 9 circuit miles	Met Target: 6 Actual: 6.3	Met Target: 6 Actual: 6.3	Met Target: 6 Actual: 6.3	WMP targets conflict with QDR and EC ARC.
Patrol inspections of vegetation around distribution electric lines and equipment (7.3.5.11) Target: 167 miles	Met Target: 171 Actual: 235	Met Target: 171 Actual: 235	Met Target: 171 Actual: 235	WMP targets conflict with QDR and EC ARC.

The majority of Liberty's 2022 WMP Update initiative activities in 2022 are accounted for in Liberty's EC ARC, IE ARC, and QDR submissions. However, Liberty's approved 2022 WMP Update proposed several WMP initiative activities for the 2022 compliance year that were not described in its EC ARC, IE ARC, or in the QDR submissions reviewed by Energy Safety. Each activity outlined in Liberty's WMP must be accounted for by Liberty in its EC ARC and QDR submissions. In cases where this accounting did not occur, Energy Safety requested further data from Liberty on those activities that were unaccounted for, including a description of the work completed in 2022. (LU DR 250.) The table below describes the result.

Table 6: Liberty's WMP Initiative Activity Attainment and Data Requests

2022 WMP Initiative	Unaccounted 2022 WMP Activity	Liberty Utilities' Description of 2022 Work
Summarized risk map that shows overall ignition probability and estimated wildfire consequence along the electric lines and equipment (7.3.1.1)	Use REAX wildfire risk polygons as the basis for updating its circuit risk assessment and for wildfire mitigation planning. Continue to analyze asset risk, tree risk and outage risk and risk reduction from WMP initiative implementation	Contractors completed the development of a Scope of Work (SOW) and cost proposal to implement tools to support development of Liberty's Risk Based Decision Making Framework in October 2022. SOW included development of tools and processes to derive estimated ignition probability and consequence along Liberty's lines and equipment.
Climate-driven risk map and modelling based on various relevant weather scenarios (7.3.1.2)	Continue using tools such as REAX maps and data to estimate the incremental risk of foreseeable climate scenarios, such as drought, across a given portion of the grid (or, more granularly, e.g., circuit, span, or asset).	Liberty's response to LU DR 250 indicated that Liberty's description of 2022 work on initiative 7.3.1.1 applied to this initiative as well.
Ignition probability mapping showing the probability of ignition along the electric lines and equipment (7.3.1.3)	Use available data and tools to analyze asset risk and processes to assess the risk of ignition across regions of the grid (or, more granularly, e.g., circuits, spans, or assets).	See Liberty's description of 2022 work to initiative 7.3.1.1 in this table as it applied to this initiative as well.
Initiative mapping and estimation of wildfire and PSPS risk-reduction impact (7.3.1.4)	Develop a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and the risk-spend efficiency of various initiatives.	See Liberty's description of 2022 work to initiative 7.3.1.1 in this table as it applied to this initiative as well.

2022 WMP Initiative	Unaccounted 2022 WMP Activity	Liberty Utilities' Description of 2022 Work
Match drop simulations showing the potential wildfire consequence of (7.3.1.5)	Develop and use of tools and processes to assess impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary damages, area burned, impact on air quality and greenhouse gas (GHG) reduction goals, etc.)	See Liberty's description of 2022 work to initiative 7.3.1.1 in this table as it applied to this initiative as well.
Fault indicators for detecting faults on electric lines and equipment (7.3.2.3)	Installation and maintenance of fault indicators.	A spreadsheet was provided indicating asset locations and data transmitted from assets at 22 locations.
Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions (7.3.2.5)	Personnel position within utility service territory to monitor system conditions and weather on site. Field observations shall inform operational decisions.	Proactive patrols along power lines were not activated in 2022 as there were no PSPS events in 2022.
Weather forecasting and estimating impacts on electric lines and equipment (7.3.2.6)	Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision-making, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.	Numerous meeting dates were provided to exemplify frequent communications with REAX.

2022 WMP Initiative	Unaccounted 2022 WMP Activity	Liberty Utilities' Description of 2022 Work
Other corrective action (7.3.3.12)	Other maintenance, repair, or replacement of utility equipment and structures so that they function properly and safely, including remediation activities (such as insulator washing) of other electric equipment deficiencies that may increase ignition probability due to potential equipment failure or other drivers.	Liberty referred to meeting its stated commitment to remove and replace 1,500 non-exempt fuses and exceeded by 358 units for a total of 1,858 non-exempt fuses being replaced.
Improvement of Inspections (7.3.4.3)	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.	A spreadsheet was provided listing personnel inspection findings, re-training dates, and re-inspection by other personnel with different inspection findings for developing improvements.
Crew-accompanying ignition prevention and suppression services (7.3.6.3)	Those firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, and water) that are deployed with construction crews and other electric workers to provide site-specific fire prevention and ignition mitigation during on-site work.	Liberty provided information regarding fire prevention equipment on service trucks and a reference to its Fire Prevention Plan.
Protocols for PSPS re-energization (7.3.6.5)	Designing and executing procedures that accelerate the restoration of electric service in areas that were de-energized, while maintaining safety and reliability standards.	Liberty provided references for its Corporate Emergency Response Plan, and multiple PSPS Playbooks.

2022 WMP Initiative	Unaccounted 2022 WMP Activity	Liberty Utilities' Description of 2022 Work
Tracking and analysis of near miss data (7.3.7.4)	Tools and procedures to monitor, record, and conduct analysis of data on near miss events.	Liberty referred to meeting its QDR requirements to report risk event / near miss data. Additionally, Liberty referred to its 2023 WMP, Appendix D: Areas for Continued Improvement, Code and Title: LU-22-04 and LU-22-05.
Risk spends efficiency analysis (7.3.8.3)	Tools, procedures, and expertise to support analysis of wildfire mitigation initiative risk-spend efficiency, in terms of MAVF and/ or MARS methodologies.	This is included in the SOW referenced for initiative 7.3.1.1 in this table.
Disaster and emergency preparedness plan (7.3.9.4)	Development of plan to deploy resources according to prioritization methodology for disaster and emergency preparedness of utility and within utility service territory (such as considerations for critical facilities and infrastructure), including strategy for collaboration with Public Safety Partners and communities.	Liberty referred to its Comprehensive Emergency Management Plan (CEMP) in addition to the prior references of its Fire Prevention Plan and PSPS Playbooks.

2022 WMP Initiative	Unaccounted 2022 WMP Activity	Liberty Utilities' Description of 2022 Work
Protocols in place to learn from wildfire events (7.3.9.6)	Tools and procedures to monitor effectiveness of strategy and actions taken to prepare for emergencies and of strategy and actions taken during and after emergencies, including based on an accounting of the outcomes of wildfire events.	Liberty referred to its completed After-Action Reports/Improvement Plans for its 2022 Tabletop and Functional exercises.
Cooperation and best practice sharing with agencies outside CA (7.3.10.2)	Strategy and actions taken to engage with agencies outside of California to exchange best practices both for utility wildfire mitigation and for stakeholder cooperation to mitigate and respond to wildfires.	Liberty stated that it cooperates with Nevada Energy via coordination meetings and as part of the Western Region Mutual Assistance Agreement (WRMAA). In its PSPS exercises, Liberty stated that it includes the Cybersecurity and Infrastructure Security Agency (CISA) and Nevada Energy as participants. Liberty also cooperates with the US Forest Service on vegetation management efforts and work permitting.

2022 WMP Initiative	Unaccounted 2022 WMP Activity	Liberty Utilities' Description of 2022 Work
Cooperation with suppression agencies (7.3.10.3)	Coordination with CAL FIRE, federal fire authorities, county fire authorities, and local fire authorities to support planning and operations, including support of aerial and ground firefighting in real-time, including information-sharing, dispatch of resources, and dedicated staff.	Liberty provided a list of PSPS exercise participants in 2022 including CAL FIRE and local fire authorities such as Truckee Fire. Liberty stated that it coordinates with Fire Districts in its service territory on fire suppression and ignition reporting when a utility equipment related ignition occurs. Local fire districts provide Liberty with information regarding ignitions for investigation and reporting. Liberty stated that its Vegetation Management team members regularly attend the Tahoe Fire and Fuels Team South Division meetings that are held weekly in South Lake Tahoe.
Forest Service and fuel reduction cooperation and joint roadmap (7.3.10.4)	Strategy and actions taken to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).	In November 2022, Liberty stated that it entered into an agreement with The National Forest Foundation (NFF) for a resilience program.

Appendix B: EC ARC Information on WMP Initiative Activity Attainment

Table 7: Liberty's WMP Initiative Activity Attainment

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment (7.3.1.1)	Use wildfire risk polygons as the basis for updating circuit risk assessment and for wildfire mitigation planning. Continue to analyze asset risk, tree risk, outage risk, and risk reduction from WMP initiative implementation.	Liberty reported using circuit risk analysis and fire risk mapping to inform planning and prioritize WMP initiative work within the Situational Awareness, Gride Design and System Hardening, Asset Management and Inspections, and Vegetation Management WMP categories. Liberty also continued work with REAX to scope updates for the wildfire risk model and fire risk map, initiated conversations with vendors to scope workstreams related to wildfire and PSPS analysis and collected data to update circuit risk analysis. Liberty reported it incurred no costs for this initiative.
Advanced weather monitoring and weather stations (7.3.2.1)	Install ten weather stations.	Liberty reported it installed five weather stations, missing its target. When discussing expenditures, Liberty stated it over expended on this initiative due to unplanned costs.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Continuous monitoring sensors (7.3.2.2)	Install DFA hardware on 10[15] distribution feeders by the end of 2022. High Impedance Fault Detection (HIFD) is set to be deployed in 2022. The HIFD settings produced by University of Nevada Reno will be installed into the protection relays feeding piloted lines. Finalize partnership for eight fire cameras in the second quarter of 2022, which will provide access to the camera network prior to 2022 fire season.	Liberty reported it installed ten DFA units at the Meyers, Stateline, and Northstar Substations—all expected to come online within first half of 2023. Liberty also stated it installed HIFD on the Meyers 3400 circuit but determined it will not pursue this elsewhere due to unfavorable study results from University of Nevada Reno. Liberty did not discuss progress over its partnership for the deployment of eight fire cameras.
Fault indicators for detecting faults on electric lines and equipment (7.3.2.3)	Install two circuits with fault indicators.	Liberty did not discuss progress on this specific initiative in its EC ARC, other than to state it incurred less DFA costs than planned as part of initiative 7.3.2.2, as Liberty aggregated expenditure for these two initiatives together.
Forecast of a fire risk index, fire potential index, or similar (7.3.2.4)	Continue use of FPI for fire risk awareness, improving operational decision-making, and ensuring ongoing improvements in forecast accuracy for effective wildfire mitigation.	Liberty reported continued use of FPI daily during fire season to forecast fire weather conditions. Incorporated FPI into the Fire Prevention Plan, which includes operating protocols for field crews daily. Liberty stated it incurred no costs for this initiative.

[15] In Section 7.3.2.2 of its 2022 WMP Liberty states a target of 105 DFA installations, but based on review of 2022 Q1 QDR Table 12, which states a target of 10 units, this is presumed to be a clerical error.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault (7.3.3.2)	Complete one substation circuit breaker replacement.	Liberty did not discuss progress on this initiative in its EC ARC other than stating it incurred no costs.
Covered conductor installation (7.3.3.3)	Complete 9.55 miles of covered conductor installation.	Completed 9.6 miles of covered conductor installation.
Distribution pole replacement and reinforcement, including with composite poles (7.3.3.6)	Complete 231 pole replacements.	Completed 226 pole replacements. Liberty did not provide rationale for the missed target but noted it over expended on this initiative due to difficulty in accessing poles.
Expulsion fuse replacement (7.3.3.7)	Complete 1,500 expulsion fuse replacements.	Completed 1,858 expulsion fuse replacements.
Grid topology improvements to mitigate or reduce PSPS events (7.3.3.8)	Prepare to launch Phase 1 of the Customer Resiliency Program in 2023 pending approval by the CPUC.	Liberty did not discuss progress on this initiative in its EC ARC other than stating it incurred more costs than it anticipated.
Installation of system automation equipment (7.3.3.9)	Install four-line reclosers.	Installed two automatic reclosers. Liberty reported the remaining two automatic reclosers were delayed due to access issues caused by snow and avalanche danger.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Other corrective action (7.3.3.12)	Tree attachments: Complete 45[16] tree attachment removals. Animal guards: Complete animal guard installations on the six[17] largest substations. CAL FIRE exempt hardware: Continue actively using CAL FIRE exempt hardware on all new and replacement installations. Open wire/grey wire: Continue actively identifying areas with open wire/grey wire secondary and then verifying that pole calculations are adequate and then conduct replacement.	Completed 145 tree attachment removals, and four animal guard installations at substations. Liberty states it over expended on this initiative due to capturing additional costs for open wire/grey wire and substation equipment removal. Liberty did not discuss progress regarding its use of CAL FIRE exempt hardware.
Undergrounding of electric lines and/or equipment (7.3.3.16)	Complete 0.36[18] miles of undergrounding in addition to Rule 20 undergrounding projects.	Completed 0.24 miles of undergrounding. When discussing under expenditure, Liberty noted that two of three undergrounding projects were delayed due to permitting issues.
Detailed inspections of distribution electric lines and equipment (7.3.4.1)	Complete 308 miles of inspections.	Completed 328.6 miles of inspections.

[16] While Table 12 of the QDR states a target of 60 units, Table 5.3-1 of the WMP and Section 7.3.3.12 of the WMP state a target of 45 tree attachment removals.
[17] While Table 5.3-1 of the WMP states a target of four animal guard installations, Section 7.3.3.12 of the WMP states a target of installing animal guards on six substations.
[18] While Section 7.3.3.16 of the WMP states a target of 0.37 miles, Table 5.3-1 of the WMP, as well as Table 12 of the QDR, state a target of 0.36 miles.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Intrusive pole inspections (7.3.4.6)	Complete 2,598[19] pole inspections.	Completed 2,735 pole inspections.
Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations (7.3.4.9)	Complete operations and maintenance repairs for all Level 2 findings.	Liberty reported it prioritized repairs by GO 95 level and wildfire risk where applicable and noted costs were lower than projected overall—however, it did not clarify whether it met its intended target.
Patrol inspections of distribution electric lines and equipment (7.3.4.11)	Complete 706[20] miles of inspections.	Completed 503 miles of inspections. Liberty states that its target of 706 miles was erroneously established and should have been closer to 503 miles.
Quality assurance / quality control of inspections (7.3.4.14)	Complete inspections on 0.5% of circuit miles.	Completed inspections on 0.44% of circuit miles and did not provide an explanation for this missed target.
Substation inspections (7.3.4.15)	Complete 42 substation inspections.	Completed 45 substation inspections.

[19] While Section 7.3.4.6 of the WMP states a target of 2,600 pole inspections, Table 5.3-1 of the WMP, as well as Table 12 of the QDR, state a target of 2,598 pole inspections.
[20] The 2022 Q1 QDR's target of 70 units is understood by Energy Safety agree with the Table 5.3-1 target of 706 miles from the 2022 WMP Update.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Additional efforts to manage community and environmental impacts (7.3.5.1)	Complete nine miles of treatment.	Completed 6.3 miles of treatment. Liberty reported that it met its target for this initiative. However, the target reported in the EC ARC is stated as six miles, which is inconsistent from the WMP target.
Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment (7.3.5.2)	Complete 221 miles of inspections.	Completed 201.6 miles of inspections. Liberty stated actual miles were less than targeted due to a high amount of tree mortality that caused inspection resources to shift.
Fuel management (including all wood management) and management of “slash” from vegetation management activities (7.3.5.5)	Complete 280 acres of fuel management.	Completed 515 acres of fuel management.
Remote sensing inspections of vegetation around distribution electric lines and equipment (7.3.5.7)	Complete 701 miles of inspections. Pilot the use of imagery that has been collected along with LiDAR to perform tree health analysis. Analysis will be completed within Q2 of 2022, and testing the data for incorporating into inspection processes will begin in Q3 and Q4 of 2022.	Completed 701 miles of inspections. Liberty did not provide any progress updates on the qualitative aspect of this initiative.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Patrol inspections of vegetation around distribution electric lines and equipment (7.3.5.11)	Complete 167 miles of inspections.	Completed 235 miles of inspections.
Quality assurance / quality control of vegetation management (7.3.5.13)	Complete QA/QC on 220 miles of inspections.	Completed QA/QC on 271.7 miles of inspections.
Identification and remediation of "at-risk species" (7.3.5.15)	Complete 238 miles of identifications and remediations.	Completed 223 miles of identifications and remediations. Liberty reported actual miles and costs were less than targeted due to a high amount of tree mortality that caused tree work resources to shift.
Removal and remediation of trees with strike potential to electric lines and equipment (7.3.5.16)	Complete 127 miles of removals and remediations.	Completed 203 miles of removals and remediations.
Vegetation management to achieve clearances around electric lines and equipment (7.3.5.20)	Complete 701 miles of inspections and clearings.	Completed 701 miles of inspections and clearings.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Automatic recloser operations (7.3.6.1)	Install four-line reclosers.[21]	Installed two automatic reclosers, reporting that the remaining two automatic reclosers were delayed due to access issues from snow and avalanche danger.
Protective equipment and device settings (7.3.6.2)	Use protective equipment and device settings during high fire threat days in areas identified as significant risk for ignition.	Liberty reported continued use of fast trip/one-shot settings during high fire threats days.
Personnel work procedures and training in conditions of elevated fire risk (7.3.6.4)	Require all employees, contractors, and consultants that conduct activities in the wildland areas of the service territory receive training on an annual basis.	Liberty reported it continued to follow personnel work procedures in conditions of elevated fire risk.
PSPS events and mitigation of PSPS impacts (7.3.6.6)	Continue established plans and protocols to support all customers during potential PSPS events, including vulnerable and MBL customers. In February 2022, Liberty filed an application at the CPUC for a Customer Resiliency Program intended to provide customers, including MBL customers, with greater energy resiliency during PSPS and other hazardous events.	Liberty reported continued maintenance of emergency response plans, but noted no costs were incurred for this initiative.

[21] Liberty states the same goal for this initiative as it does for 7.3.3.9

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Stationed and on-call ignition prevention and suppression resources and services (7.3.6.7)	Purchase additional vehicles that can be used by designated field staff and crew members during elevated fire risk conditions.	Liberty did not discuss progress on this initiative in its EC ARC other than stating it incurred no costs.
Centralized repository for data (7.3.7.1)	Continue improvements and upgrades made to centralizing data systems. Continue conversations with consultants offering data analytics solutions for considering major system upgrades and integration with all current data sources.	Liberty reported it implemented GIS and OMS upgrades to wildfire mitigation data processes and discussed with a vendor potential data solution to consolidate data collection. Liberty reported it incurred no costs for this initiative.
Collaborative research on utility ignition and/or wildfire (7.3.7.2)	Deploy HIFD in 2022. HIFD settings produced by University of Nevada Reno will be installed into the protection relays feeding piloted lines.	HIFD installed on Meyers 3400 circuit but noted it will not be pursued elsewhere due to unfavorable UNR study results. Liberty reported it incurred no costs for this initiative.
Allocation methodology development and application (7.3.8.1)	Continue to refine risk modeling and risk spend efficiency calculations, based on maturation of the risk analysis process and lessons learned from other utilities.	Liberty reported it used circuit risk analysis and fire mapping to inform planning and prioritize work for WMP initiatives. Liberty reported it incurred no costs for this initiative.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Adequate and trained workforce for service restoration (7.3.9.1)	Ensure an adequate and trained workforce for service restoration. Add additional crew members to improve emergency restoration and normal day-to-day work.	Liberty reported it held Incident Command System Training for work personnel but did not discuss how it ensured adequate numbers of crew members were in place to improve emergency restoration.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Community outreach, public awareness, and communications efforts (7.3.9.2)	Continue community outreach, public awareness, and communication efforts, including Use of digital communications in 2022 and beyond. Adding two positions to expand CBO relationship networks and communications channels and plans to make further progress throughout 2022, including a bilingual Outreach Coordinator. Continue practice of facilitating daily workshops for both Public Safety Partners (PSP) and customers during potential PSPS events in 2022. Use gathered feedback to evaluate, refine and improve customer and public education efforts for 2022 and follow a similar process in the coming years. Invest in improvements that enhance both wildfire safety and PSPS communications in 2022. The public education campaign will start earlier in the year and will work to expand the reach of communications within the service territory. Implement an adjusted strategy for 2022 AFN identification and continue to focus on available resource communication in 2022.	Liberty submitted the 2022 AFN plan to the CPUC, participated in Community Advisory Boards and meetings with various community leaders of Public Safety Partners, held a Full-Scale Exercise with Public Safety Partners, and continued advertising campaigns specific to wildfire mitigation and PSPS preparation and awareness. This included 47 social media posts, six website posts, four rounds of bill insets, 28 sets of emails, and continued print and digital advertising. Liberty also reported continued engagement with CBOs and PSPs.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Customer support in emergencies (7.3.9.3)	Continue customer support in emergencies.	Liberty reported continued engagements with CBOs and PSPs. Liberty states these engagements are essential to preparing customers and stakeholders for potential PSPS and wildfire events.
Preparedness and planning for service restoration (7.3.9.5)	Exercise the PSPS plan annually and incorporate lessons learned.	Exercised a PSPS exercise and a PSPS Full scale Exercise with PSPs. Exercises included enhanced documentation and use of lessons learned. Liberty stated it overspent on this initiative.

2022 WMP Initiative	2022 Activity Target	2022 Actual as Reported by EC ARC
Community engagement (7.3.10.1)	Continue awareness, with a focus on improved customer, community, and utility readiness in the face of growing wildfire threat. Outreach and engagement objectives for 2022 include: Adapting to shifting needs and priorities in emergency preparedness and wildfire mitigation. Hosting regionalized discussions with public safety partners to enhance knowledge of regional driving factors for PSPS events and other potential emergency events. Strengthening partnerships between public safety partners and Liberty representatives, establishing point-of contacts that can address needs both during an emergency event and throughout the year. Customizing outreach approach and cadence based upon the community's wildfire risk, with a key focus on providing more heavily impacted communities with information and resources. Approaching public safety partners and customers with transparency while providing timely and accurate information that supports emergency preparedness and localized wildfire mitigation efforts.	Liberty reported continued advertising campaigns specific to wildfire mitigation and PSPS preparation and awareness, including 47 social media posts, six website posts, four rounds of bill insets, 28 sets of emails, and continued print and digital advertising. Liberty also reported continued public education and outreach efforts associated with the WMP, including attending 39 in-person events and 19 virtual events to share wildfire mitigation effort information, as well as continued development of the AFN plan and submission of the 2022 AFN plan to the CPUC. In 2022, Liberty noted it exercised a PSPS exercise and a PSPS Full-Scale Exercise and continued engaging with CBOs and PSPs.

Appendix C: EC ARC Information on WMP Initiative Expenditures

Table 8: Liberty's WMP Initiative Expenditures

2022 WMP Initiative Activity	2022 WMP Identifier	2022 Expense Forecast	2022 Expense Actual	2022 Expense (Over)/Under Spend
A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	7.3.1.1	$55,000	$-	$55,000
Advanced weather monitoring and weather stations	7.3.2.1	$115,000	$373,599	$(258,599)
Continuous monitoring sensors	7.3.2.2	$190,000	$-	$190,000
Fault indicators for detecting faults on electric lines and equipment	7.3.2.3	$-	$52,274	$(52,274)
Forecast of a fire risk index, fire potential index, or similar	7.3.2.4	$10,000	$-	$10,000
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	7.3.3.2	$400,000	$-	$400,000
Covered conductor installation	7.3.3.3	$14,915,000	$9,609,726	$5,305,274
Distribution pole replacement and reinforcement, including with composite poles	7.3.3.6	$6,000,000	$6,909,449	$(909,449)
Expulsion fuse replacement	7.3.3.7	$1,500,000	$3,431,689	$(1,931,689)

2022 WMP Initiative Activity	2022 WMP Identifier	2022 Expense Forecast	2022 Expense Actual	2022 Expense (Over)/Under Spend
Grid topology improvements to mitigate or reduce PSPS events	7.3.3.8	$-	$264,092	$(264,092)
Installation of system automation equipment	7.3.3.9	$360,000	$191,333	$168,667
Other corrective action	7.3.3.12	$2,536,000	$6,658,246	$(4,122,246)
Undergrounding of electric lines and/or equipment	7.3.3.16	$7,000,000	$474,984	$6,525,016
Detailed inspections of distribution electric lines and equipment	7.3.4.1	$400,000	$919,391	$(519,391)
Intrusive pole inspections	7.3.4.6	$150,000	$99,050	$50,950
Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	7.3.4.9	$4,600,000	$3,578,513	$1,021,487
Patrol inspections of distribution electric lines and equipment	7.3.4.11	$60,000	$-	$60,000
Quality assurance / quality control of inspections	7.3.4.14	$30,000	$-	$30,000
Substation inspections	7.3.4.15	$10,000	$-	$10,000
Additional efforts to manage community and environmental impacts	7.3.5.1	$754,000	$928,068	$(174,068)
Detailed inspections of vegetation around distribution electric lines and equipment	7.3.5.2	$715,000	$872,050	$(157,050)
Fuel management and reduction of “slash” from vegetation management activities	7.3.5.5	$1,163,000	$1,515,124	$(352,124)
LiDAR inspections of vegetation around distribution electric lines and equipment	7.3.5.7	$764,000	$754,192	$9,808

2022 WMP Initiative Activity	2022 WMP Identifier	2022 Expense Forecast	2022 Expense Actual	2022 Expense (Over)/Under Spend
Patrol inspections of vegetation around distribution electric lines and equipment	7.3.5.11	$357,000	$638,341	$(281,341)
Quality assurance / quality control of vegetation inspections	7.3.5.13	$418,000	$447,301	$(29,301)
Remediation of at-risk species	7.3.5.15	$5,704,000	$3,148,611	$2,555,389
Removal and remediation of trees with strike potential to electric lines and equipment	7.3.5.16	$2,709,000	$5,443,730	$(2,734,730)
Vegetation management to achieve clearances around electric lines and equipment	7.3.5.20	$1,493,000	$2,671,110	$(1,178,110)
Protective equipment and device settings	7.3.6.2	$-	$47,183	$(47,183)
Personnel work procedures and training in conditions of elevated fire risk	7.3.6.4	$250,000	$293,292	$(43,292)
PSPS events and mitigation of PSPS impacts	7.3.6.6	$100,000	$-	$100,000
Stationed and on-call ignition prevention and suppression resources and services	7.3.6.7	$100,000	$-	$100,000
Centralized repository for data	7.3.7.1	$400,000	$-	$400,000
Collaborative research on utility ignition and/or wildfire	7.3.7.2	$120,000	$-	$120,000
Allocation methodology development and application	7.3.8.1	$300,000	$-	$300,000

2022 WMP Initiative Activity	2022 WMP Identifier	2022 Expense Forecast	2022 Expense Actual	2022 Expense (Over)/Under Spend
Adequate and trained workforce for service restoration	7.3.9.1	$1,304,000	$-	$1,304,000
Customer support in emergencies	7.3.9.3	$-	$64,591	$(64,591)
Preparedness and planning for service restoration	7.3.9.5	$-	$662,399	$(662,399)
Community engagement	7.3.10.1	$144,000	$83,637	$60,363
Total		**$55,126,000**	**$50,131,976**	**$4,994,024**

Appendix D: Substantial Vegetation Management Audit of Liberty Utilities

On August 13, 2024, Energy Safety issued its SVM Audit for Liberty Utilities. The purpose of the SVM Audit is to assesses whether Liberty Utilities met its quantitative commitments and verifiable statements in its 2022 WMP related to vegetation management.

In the SVM Audit, Energy Safety found three instances where Liberty did not perform all required work and required Liberty to provide a response in its Corrective Action Plan.

After reviewing Liberty's Corrective Action Plan, filed on September 12, 2024, Energy Safety issued its SVM Audit Report on October 10, 2024, finding that Liberty sufficiently addressed the issues raised in the Corrective Actions and therefore substantially complied with the substantial portion of the vegetation management requirements in its 2022 WMP Update. The specific findings from Energy Safety's SVM Audit Report are detailed in the table below.

Table 9: Liberty's WMP Vegetation Management Initiatives

2022 WMP Initiative Number	2022 WMP Initiative Name	Determination
7.3.5.1	Additional Efforts to Manage Community and Environmental Impacts	Performed Required Work
7.3.5.2	Detailed Inspections and Management Practices or Vegetation Clearances around Distribution Electrical Lines and Equipment	Performed Required Work

2022 WMP Initiative Number	2022 WMP Initiative Name	Determination
7.3.5.3	Detailed Inspections and Management Practices for Vegetation Clearances Around Transmission Electric Lines and Equipment	Performed Required Work Refer to 7.3.5.2
7.3.5.4	Emergency Response Vegetation Management due to Red Flag Warning or Other Urgent Climate Conditions	Performed Required Work Refer to 7.3.5.2, 7.3.5.3, 7.3.5.5, 7.3.5.7, 7.3.5.8, 7.3.5.11, 7.3.5.12, 7.3.5.15, and 7.3.5.16.
7.3.5.5	Fuels Management (including all wood management) and Reduction of “slash” from Vegetation Management Activities	Performed Required Work
7.3.5.6	Improvement of Inspections	Performed Required Work
7.3.5.7	Remote Sensing Inspections of Vegetation Around Distribution Electric Lines and Equipment	Performed Required Work
7.3.5.8	Remote Sensing Inspections of Vegetation Around Transmission Electric Lines and Equipment	Performed Required Work Refer to 7.3.5.7
7.3.5.9	Other Discretionary Inspections of Vegetation Around Distribution Electric Lines and Equipment, Beyond Inspections Mandated by Rules and Regulations	Performed Required Work Refer to 7.3.5.2, 7.3.5.7, and 7.3.5.11.
7.3.5.10	Other Discretionary Inspections of Vegetation Around Transmission Electric Lines and Equipment, Beyond Inspections Mandated by Rules and Regulations	Performed Required Work Refer to 7.3.5.3, 7.3.5.8, and 7.3.5.12
7.3.5.11	Patrol Inspections of Vegetation Around Distribution Electric Lines and Equipment	Performed Required Work

2022 WMP Initiative Number	2022 WMP Initiative Name	Determination
7.3.5.12	Patrol Inspections of Vegetation Around Transmission Electric Lines and Equipment	Performed Required Work Refer to 7.3.5.11.
7.3.5.13	Quality Assurance / Quality Control of Vegetation Management	Performed Required Work
7.3.5.14	Recruiting and Training of Vegetation Management Personnel	Performed Required Work
7.3.5.15	Identification and Remediation of "At-Risk Species"	Performed Required Work
7.3.5.16	Removal and Remediation of Trees with Strike Potential to Electric Lines and Equipment	Performed Required Work
7.3.5.17	Substation Inspections	Performed Required Work Refer to 7.3.5.2, 7.3.5.3, 7.3.5.11, and 7.3.5.12
7.3.5.18	Substation Vegetation Management	Performed Required Work
7.3.5.19	Vegetation Management System	Performed Required Work
7.3.5.20	Vegetation Management to Achieve Clearances Around Electric Lines and Equipment	Performed Required Work
7.3.5.21	Vegetation Management Activities Post-Fire	Performed Required Work

Appendix E: Performance Metrics Appendix Figures

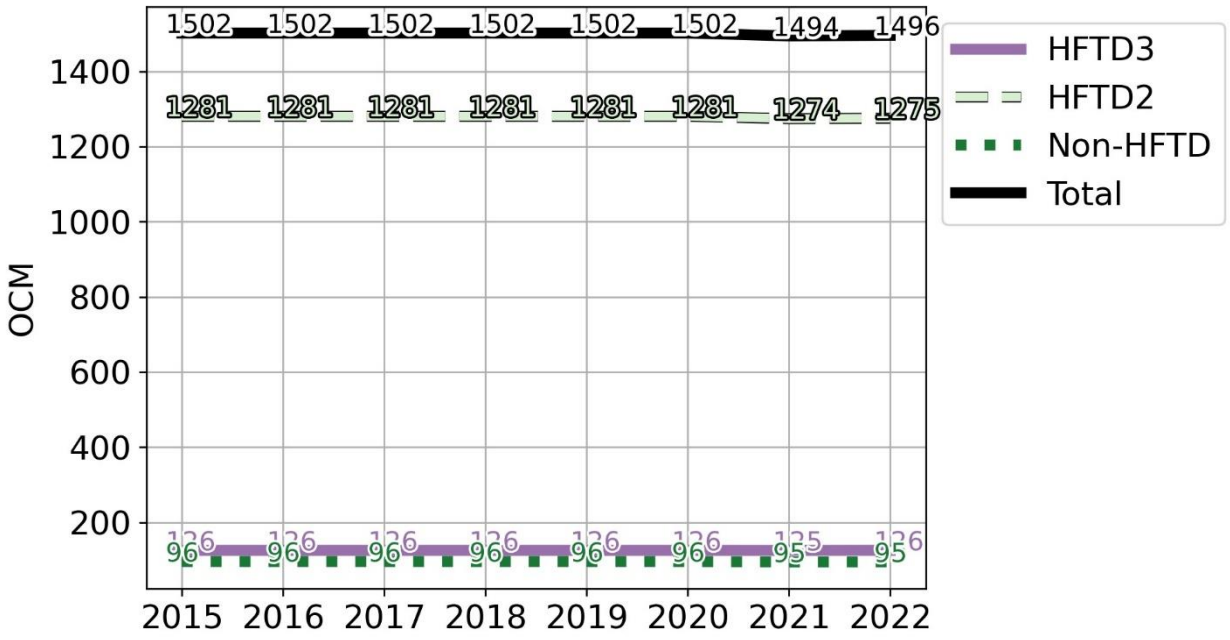
9.1.1 Normalizing Metrics

Data for this appendix come from the fourth quarter QDR as reported by Liberty. (2022 Q3 QDR, Tables 6, 7.1, 7.2, and 8; 2023 Q4 QDR, Tables 4, 5, 6, and 7.)

Overhead Circuit Miles:

The number of OCMs have small differences from 2021 to 2022. The slight decrease in total OCM is due to some Non-HFTD and HFTD Tier 2 miles of lines being removed from the network more recently (Figure 18).

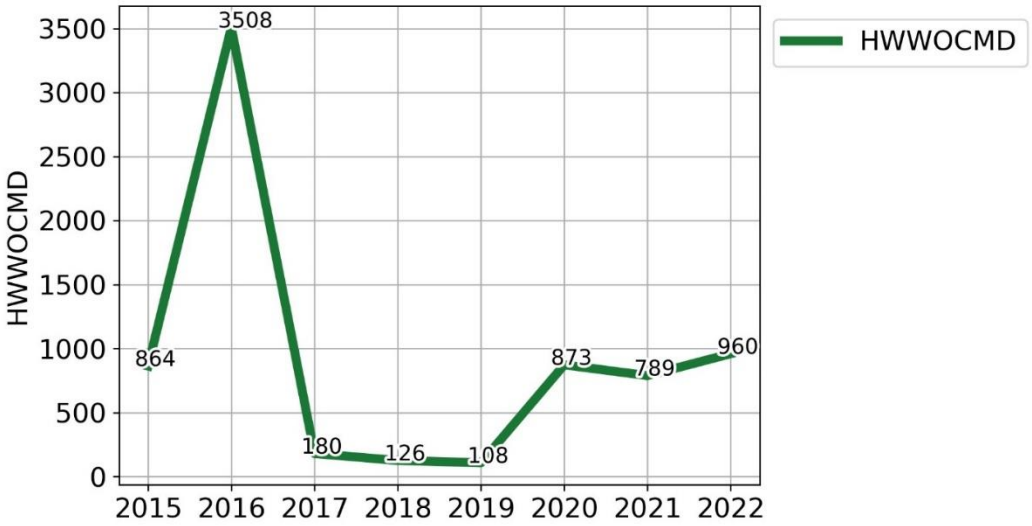
Figure 18: Liberty Overhead Circuit Miles



High Wind Warning Overhead Circuit Mile Days:

There has been a general decrease in the frequency of HWWOCMD after a peak in 2016. However, HWWOCMD has been increasing again through 2022 (Figure 19).

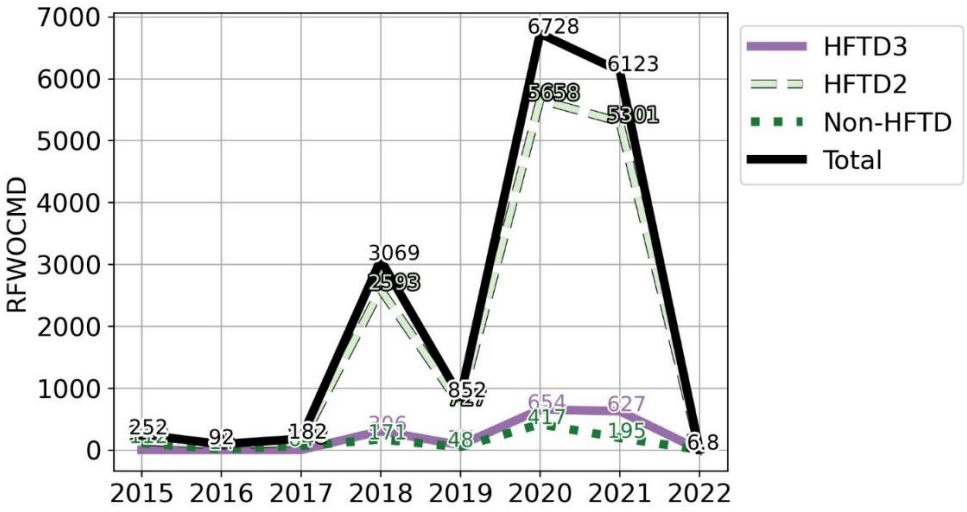
Figure 19: Liberty High Wind Warning Overhead Circuit Mile Days



Red Flag Warning Overhead Circuit Mile Days:

There was a peak of RFWOCMD in 2020 that has generally been decreasing to 2022, particularly in HFTD Tier 2 areas. RFWOCM decreased significantly between 2021 and 2022 (Figure 20).

Figure 20: Liberty Red Flag Warning Overhead Circuit Mile Days (2015-2022) by HFTD Tiers

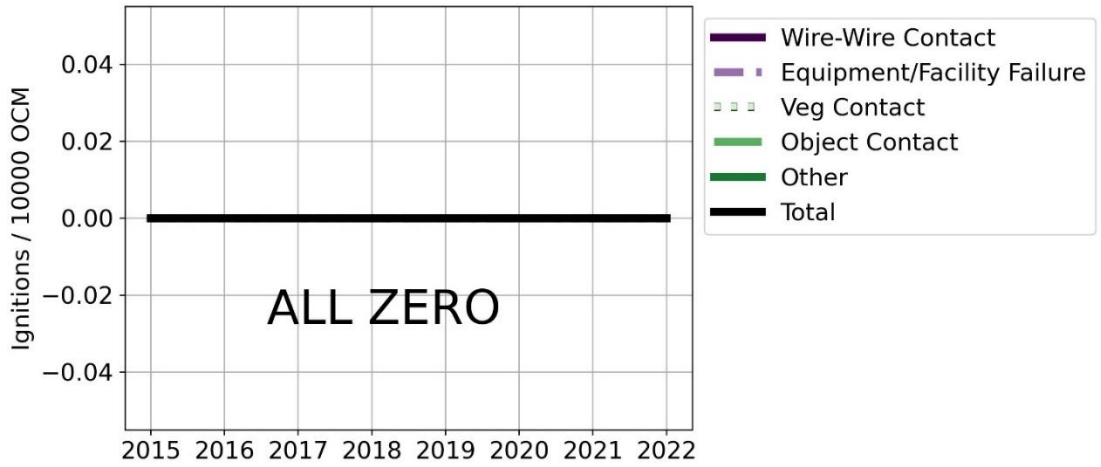


9.1.2 More Detailed Ignition Risk Findings

Distribution Ignitions Normalized by Overhead Circuit Miles in Tier 3 HFTD Delineated by Risk Driver:

Zero ignitions occurred in HFTD Tier 3 areas for distribution lines between 2015 and 2022 (Figure 21).

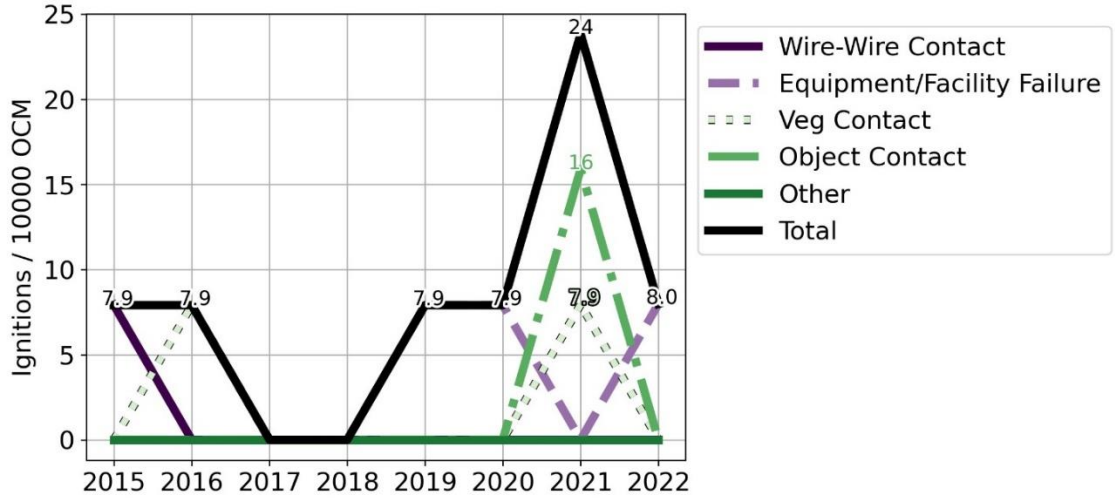
Figure 21: Liberty Distribution Ignitions in HFTD Tier 3 Areas, Normalized by Overhead Circuit Miles (2015-2022), Broken out by Risk Driver



Distribution Ignitions Normalized by Overhead Circuit Miles in Tier 2 HFTD Delineated by Risk Driver:

Distribution ignitions in HFTD Tier 2 Areas, normalized by overhead circuit miles, experienced an increase from 2015 to 2021. The majority of risk drivers decreased from 2021 to 2022 with the exception of equipment and facility failure (Figure 22).

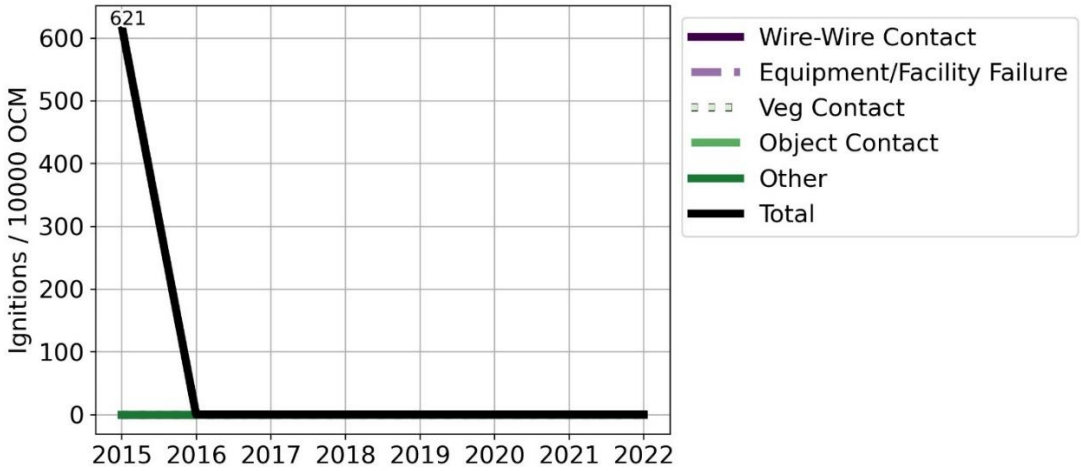
Figure 22: Liberty Distribution Ignitions in HFTD Tier 2 Areas from Normalized by Overhead Circuit Miles (2015-2022)



Transmission Ignitions Normalized by Overhead Circuit Miles in Tier 2 HFTD Delineated by Risk Driver:

In HFTD Tier 2 Areas, Liberty reported that the transmission system had zero ignitions since 2016 (Figure 23).

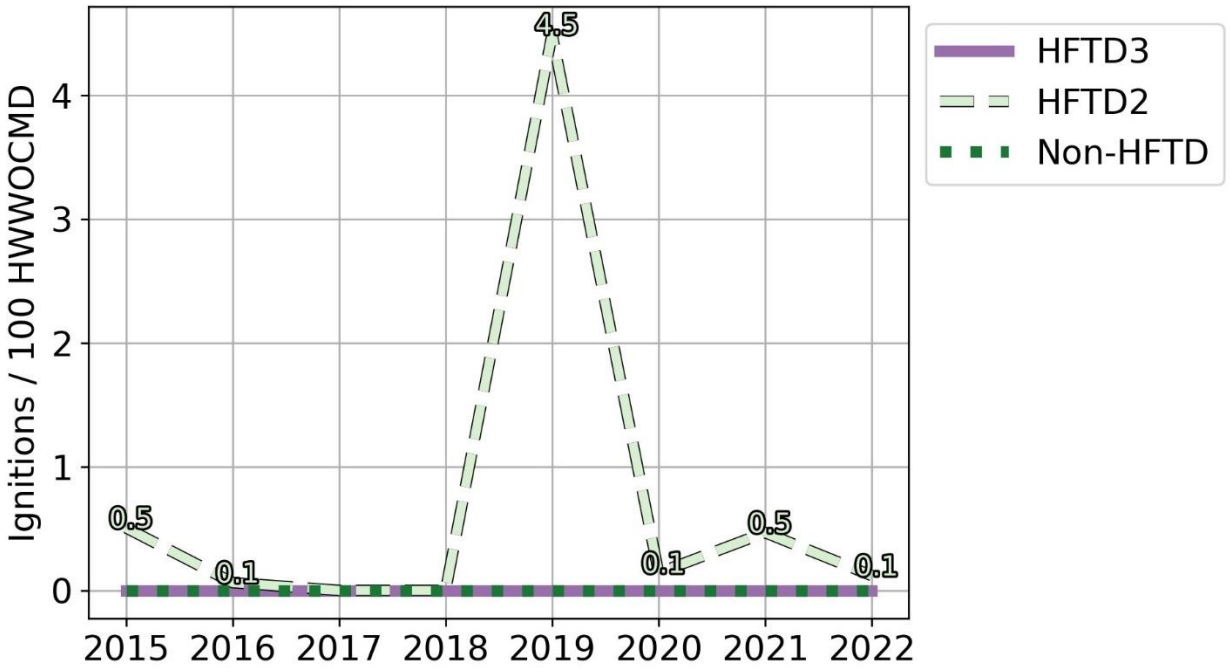
Figure 23: Liberty Transmission Ignitions in HFTD Tier 2 Areas Normalized by Overhead Circuit Miles (2015-2022) by Risk Drivers



Ignitions Normalized by High Wind Warning Overhead Circuit Mile Days:

To account for year-by-year variations in weather, ignitions were normalized by HWWOCMD (Figure 24). The normalized ignition totals significantly increased in 2019 compared to 2018, followed by another significant decrease in 2021, and a general pattern upward since 2020 by one HFTD Tier 2 classification seems to be the main driver.

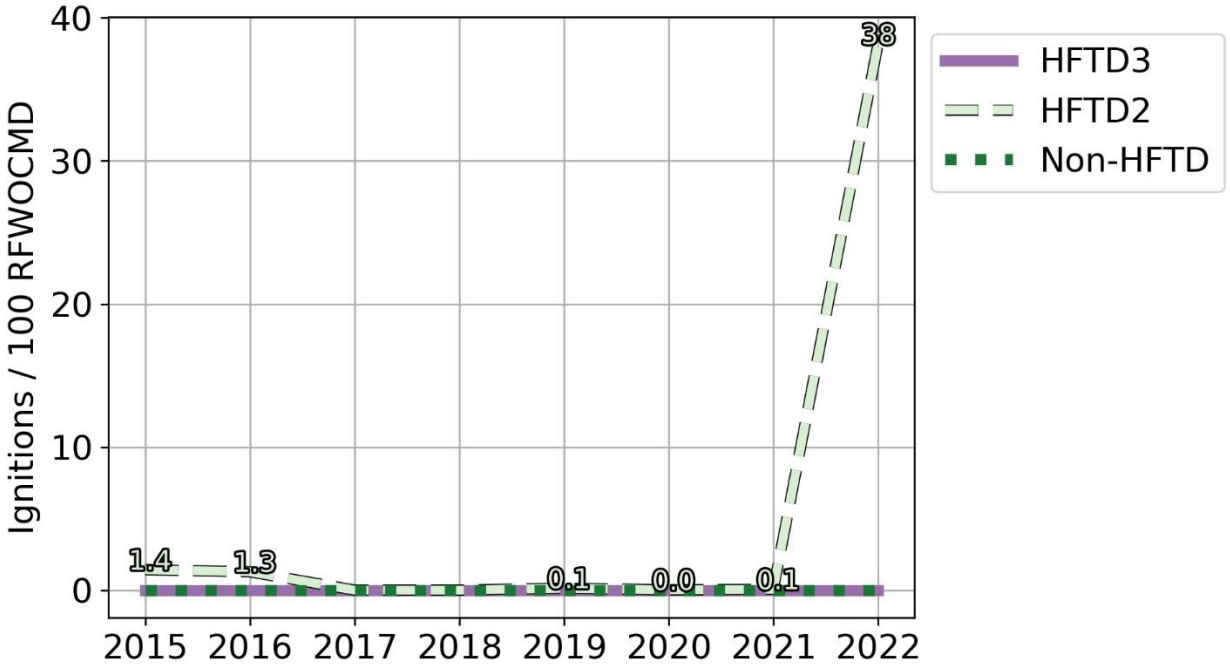
Figure 24: Liberty Ignitions Normalized by HWWOCMD (2015–2022) Delineated by HFTD Tier



Ignitions Normalized by Red Flag Warning Overhead Circuit Mile Days by HFTD Tiers:

Normalized ignitions by RFWOCMD increased from 2021 to 2022, primarily driven by ignitions in HFTD Tier 2 areas (Figure 25).

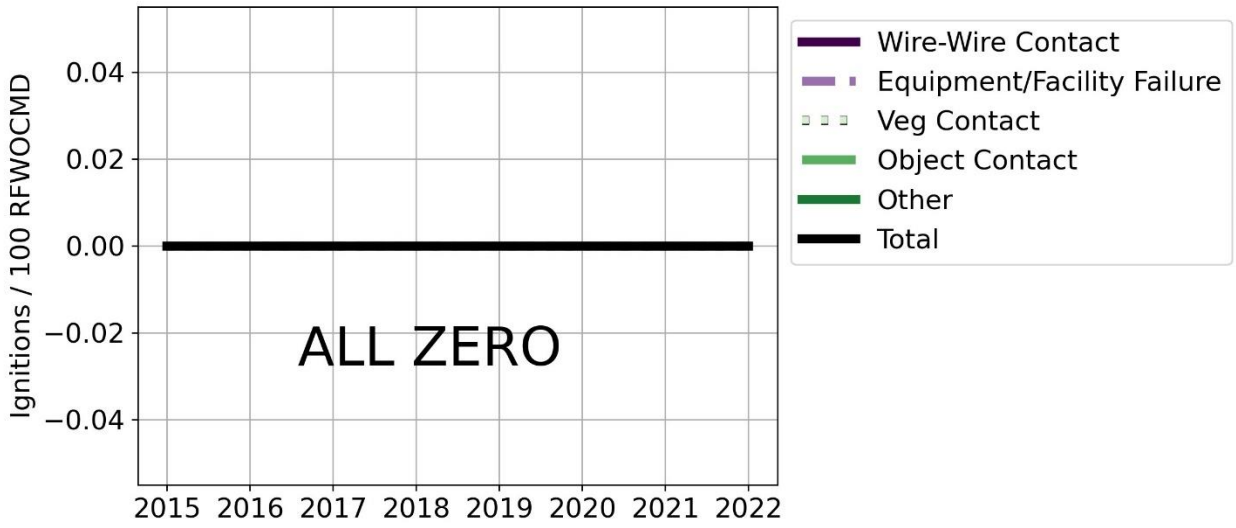
Figure 25: Liberty Ignitions Normalized by RFWOCMD (2015-2022) by HFTD Tiers



Distribution Ignitions Normalized by Red Flag Warning Overhead Circuit Mile Days in Tier 3 HFTD Delineated by Risk Driver:

Distribution ignitions in Tier 3 HFTD Areas did not occur from 2015 to 2022 (Figure 26). As such, the normalized version does not provide any additional insights.

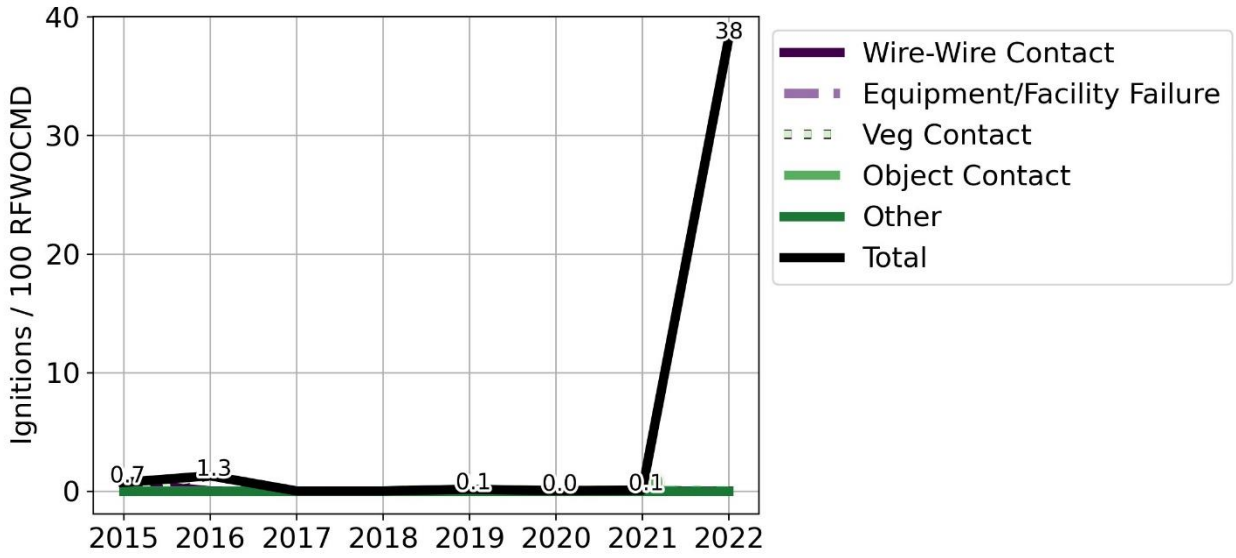
Figure 26: *Liberty Distribution Ignitions in HFTD Tier 3 Areas Normalized by RFWOCMD (2015-2022) by Risk Driver*



Distribution Ignitions Normalized by Red Flag Warning Overhead Circuit Mile Days in Tier 2 HFTD Delineated by Risk Driver:

For HFTD Tier 2 Areas normalized by RFWOCMD, there was an increase in overall distributions ignitions from 2021 to 2022 (Figure 27).

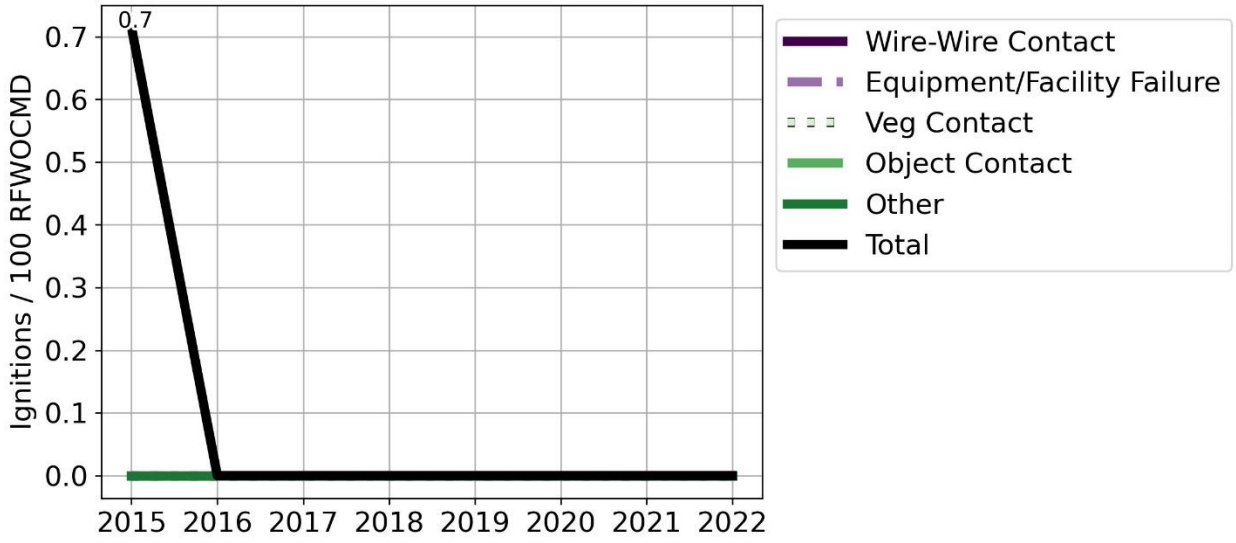
Figure 27: Liberty Distribution Ignitions in HFTD Tier 2 Areas Normalized by RFWOCMD (2015-2022) by Risk Driver



Transmission Ignitions Normalized by Red Flag Warning Overhead Circuit Mile Days in Tier 2 HFTD Delineated by Risk Driver:

For HFTD Tier 2 Areas normalized by RFWOCMD, there were zero transmission ignitions from 2016 to 2022 (Figure 28).

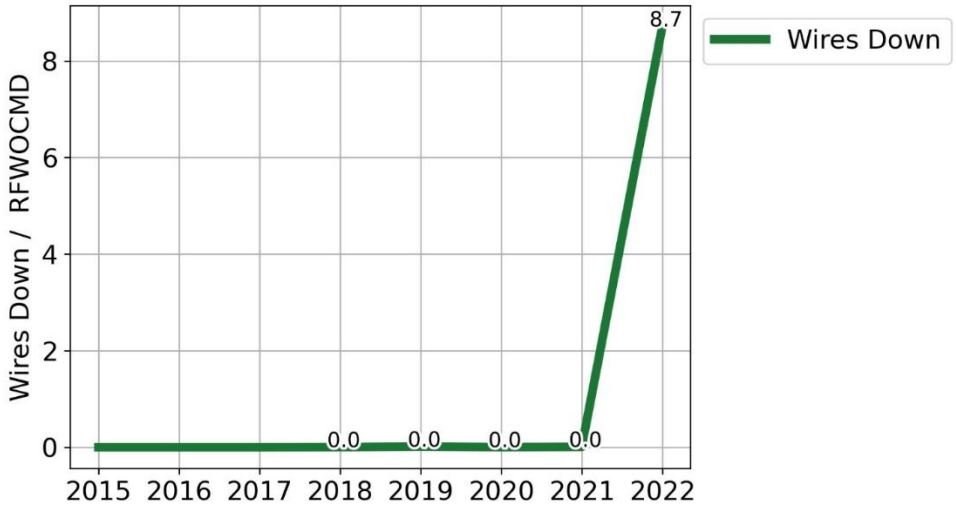
Figure 28: Liberty Transmission Ignitions in HFTD Tier 2 Areas Normalized by RFWOCMD (2015-2022) by Risk Driver



Wire Down Events Normalized by Red Flag Warning Days:

Wire down events normalized by RFWOCMD were zero from 2015-2021, but experienced an increase from 2021 to 2022 (Figure 29).

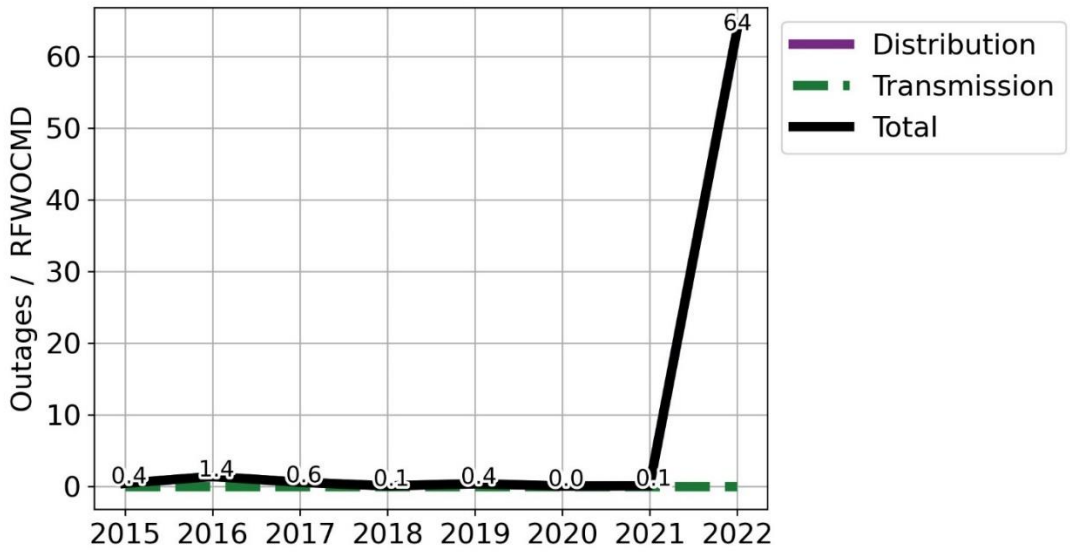
Figure 29: Liberty Total Wire Down Events Normalized by RFWOCMD (2015-2022)



Outage Events Normalized by Red Flag Warning Days:

Unplanned outage events normalized by RFWOCMD were less than two from 2015-2021, but increased to 64 in 2022. The increase in 2022 was caused by events on the distribution lines (Figure 30).

Figure 30: Liberty Total Outages Normalized by RFWOCMD (2015-2022) by Distribution and Transmission Lines



Outages Due to Vegetation Contact Normalized by Red Flag Warning Overhead Circuit Mile Days:

Unplanned outage events normalized by RFWOCMD show a steady decrease each year since peak of 2016. Between 2021 and 2022, the increase is caused by vegetation outage events on the distribution lines (Figure 31).

Figure 31: Liberty Outages from Vegetation Contacts Normalized by RFWOCMD (2015-2022) by Distribution and Transmission Lines